Rhodora

JOURNAL OF

THE NEW ENGLAND BOTANICAL CLUB

Vol. 46. December, 1944. No. 552.

AMERICAN THALICTRA AND THEIR OLD WORLD ALLIES

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Subsection **Compressa** subsect. nov. *Plantae* erectae rigidae. *Folia* supraternatisecta. *Radix* plus minusve stolonifera. *Filamenta* purpurascentia. *Antherae* luteae. *Stigma* bialatum. *Carpella* matura saepius valde reflexa plus minusve compressa, inflata tamen, nervosa vel costata, costis si adsunt obtusis et nervis obscuris. Crassitudo carpelli dimidias latitudinis vel aequat vel superat. *Nervus* ventralis carpelli convexior quam dorsalis, vel ventralis basis convexior quam dorsalis basi et dorsalis apex convexior quam ventralis apex. Species typica *Thalictrum occidentale* Gray sit.

a. Crassitudo carpelli maturi dimidias latitudinis aequat. Venter ejusdem ovatus costatus, sesquies longior quam latus ..... 98. *T. nigromontanum.*

a. Crassitudo carpelli latitudinem subaequat. Carpella matura nervosa, ter vel quater longiora quam lata ....*b.*

b. Carpella matura divaricata stipitata, ventro lanceolato. Inflorescentia ampla ad 50 cm. longa et foliosa ....*c.*

c. Stigma 3.5–4.5 mm. ..... 99. *T. occidentale,* var. *typicum.*

c. Stigma 5–6 mm. ..... 100. *T. occidentale,* var. *Macounii.*

b. Carpella matura conspicue reflexa, ventre ter longiore quam lato. Inflorescentia exserta fere decimetralis ..... 101. *T. occidentale,* var. *palouense.*

98. T. **nigromontanum,** sp. nov. *Planta* 45–65 cm. *Petioli* foliorum superiorum breves. *Inflorescentia* 5–15 cm. longa. *Pedunculi* 1–2 cm. *Sepala* floris maris 3.5–4.0 mm. longa, elliptica, foeminei ca. 1.5 mm. *Filamenta* 5.0–6.5 mm. *Antherae* ca. 3 mm., *acumine* ca. 0.4 mm. *Stigma* 3–4 mm. *Carpella* matura compressa et costata, valde reflexa, *stipite* 0.2–0.3 mm.,

ventre ovato 4–5 mm. longo, 2.5–3.0 mm. lato et ca. 1.5 mm. crasso, *nervis* a costis parum distinctis. Nervus ventralis convexior quam dorsalis. Tempus florendi a lectoribus ignotum, verosimiliter tamen Junium.—South Dakota: *W. P. Carr 135*, Deadwood, shady woods, July 31, 1913 (C, type; F, G, NY, isotypes); *Hayward 847* (in part), Black Hills, Rapid Creek & Dark Canyon, 1927 (F); *Hayward 1331*, Black Hills, Spearfish Canyon, lower 7 miles above fish hatchery, 1927 (F); *Hayward 1337*, Black Hills, Deadwood, near Pinecrest Camp, 1927 (F).

99. T. occidentale Gray. *T. dioicum* L., var. *stipitatum* Lec., Bull. Soc. Bot. Belg. **24:** 142, 1885, pars, nec *T. dioicum*, β? *stipitatum* Torr. & Gray, Fl. N. Amer. **1:** 38, 1838. *T. dioicum* L., var. *oxycarpum* Torr., Bot. Wilkes Exped. **17:** 212, 1874. *Planta* glabra vel puberulens. *Pedunculi* divaricati (1)–2–(5) cm. *Sepala* floris masculi 3.5–5.0 mm. longa et foeminei 1.5–2.5 mm. longa. *Filamenta* (5)–6–7–(10) mm., purpurascentia. *Antherae* 2–4 mm. Carpella matura nervosa, vel *nervo* dorsali convexo et ventrali convexiore, vel dorsali basi concavo et apice convexo.

The form of the fruit is highly variable in this species and transitional forms to other species occasionally occur. This also seems to hold true for the Incurvata and Laminaria. These intermediates seem to point toward the following series: *T. venulosum—T. confine—T. occidentale—T. Fendleri—T. polycarpum* in which each species is most closely related to the two adjoining ones. The two varieties given in synonymy cannot at present be related to any of the following three.

99. T. occidentale Gray, var. **typicum.** *T. occidentale* Gray, Proc. Amer. Acad. **8:** 372, 1873. *Planta* 60–120 cm. *Inflorescentia* 20–50 cm. longa, foliosa, *foliis* nonnullis petiolatis et triternatis. *Ovaria* ventro lanceolato, interdum ovato. Stigma 3.0–4.5 mm. *Carpella* matura divaricata, *stipite* 0.4–1.2 mm., ventre lanceolato 6–10 mm. longo, 1.6–2.5 mm. lato. Floret Majo et Junio.—Washington and Oregon: *Hall*, 1871 (G, type; F, isotype); *J. Howell*, Cascades, June, 1879 (G); *J. & T. Howell*, near Cascades, in rich woods, May–June, 1880 (ANS, F, US); *T. Howell*, Cascades, May, 1882 (NY); *Suksdorf 2339*, Skamania Co., near lower Cascades, May 30, 1886 (G); *Epling 5533*, Benton Co., Corvallis, May, 1922 (F); *F. E. Lloyd*, Forest Grove, low grounds, June 1, 1894 (NY); *Henderson 8*, Sandy River, warm rich hillsides, May 21–June 12, 1883 (NY); *Henderson 877*, near Columbia River, along creeks, moist rather open woods, May 27, 1924 (G). Fig. 99.

100. T. occidentale Gray, var. **Macounii** var. nov. *Planta* 80–125 cm. *Inflorescentia* sicut praecedentis. *Pedunculi* (2)–

3–(5) cm. *Ovaria* ventro lanceolato. *Stigma* 5–6 mm. *Carpella* matura *stipite* ca. 0.5, caeteris ut praecedentis. Floret Junio.—BRITISH COLUMBIA: *J. Macoun 77,395*, Vancouver Island, Koksilah River, near Cowichau, July 30, 1908 (NY, TYPE; C, ISOTYPE); *Newcombe 8*, Pr. of Wales Isl., Karta Lake, 1901–02 (F); *Newcombe 416*, Victoria, June 4, 1896 (F); *Lyall*, Vancouver Island (NY); *J. Macoun*, Vancouver Island, Nanaimo, June 10, 1887 (US); *Carter 157*, Vancouver Island, Alberni, Roger Creek, creek-bottom, May, 1915 (G); *Rosendahl 1988*, Vancouver Island, Cameron River Valley, alt. 600 ft., June 28, 1907 (US); *J. Macoun 22*, Vancouver Island, borders of streams, July 10, 1887 (G); *C. B. Wood*, Vancouver's Island, 1859 (G); *J. Macoun 849*, Sproat, woods, June 24, 1890 (C).

101. T. OCCIDENTALE Gray, var. PALOUENSE St. John, Fl. South. Wash. & Adj. Id. 158, 1937. *T. heterophyllum* Nutt. ex Gray, Proc. Amer. Acad. **8:** 372, 1873, ut synonymon dubium, nec *T. heterophyllum* Lej., Rev. Fl. Spa, 109, 1824, nec *T. heterophyllum* Schur ex Verh., Naturf. Ver. Bruenn, **15,** 2: 20, 1877, nec *T. heterophyllum* Turcz. ex Ledeb., Fl. Ross. **1:** 727, 1843. *T. propinquum* Greene, Fedde, Rep. Nov. Spec. **7:** 254, 1909. *T. rainierense* St. John, Madroño, **4:** 114, fig. 1, 1937. *Planta* (15)–60–(90) cm. *Inflorescentia* exserta 5–20 cm. longa, *foliis* reductis sessilibusque. *Pedunculi* divaricati (1)–2–(4) cm. fere omnes ejusdem longitudinis in eadem planta. *Ovaria* ventro persaepius ovato. *Carpella* matura conspicue reflexa, *stipite* 1.2–1.5 mm., ventro 4–7 mm. longo et 1.8–3.0 mm. lato. Floret Junio, Julio interdum quoque Majo et Augusto.—ALBERTA: *J. Macoun 64,406, 64,407, & 64,409*, Lake Louise, July, 1904 (C); *Butters & Holway 83*, Banff, alt. 5400–5800 ft., July 7, 1907 (G, NY); *S. Brown 434*, Pipestone Valley, alt. 6000 ft., July 7, 1906 (G); *Cram*, Crowsnest Forest Reserve, July 3, 1920 (C). MONTANA: *Flodman 484*, Bridger Mts., near The Pass, July 28, 1896 (US); *G. N. Jones 5495, 5315 & 5330*, Glacier National Park, Curbank Creek and Many Glaciers, July, 1934 (G); *J. N. Rose 38*, near Red Lodge, July 25, 1893 (G); *Kirkwood 1876*, Clearwater Forest, on Fish Lake Creek, Aug. 20, 1924 (G); *Watson 7*, Bard Mountain, alt. 7000 ft., July 21, 1880 (G). IDAHO: *Macbride 593*, Elmore Co., Trinity, creek-banks, alt. 4500 ft., Aug. 12, 1910 (C); *Sandberg, MacDougal & Heller 199*, Nez Perces Co., Craig Mountains, vicinity of Lake Waha, alt. 900 m., May 20, 1892 (G); *E. B. & L. B. Payson 2009*, Fremont Co., Henry Lake, aspen groves, alt. 6000 ft., July 14, 1920 (CA, G); *Piper 1468*, Latah Co., Cedar Mountains, July 7 (G); *Macbride 420*, Owyhee Co., Silver City, slopes along streams, alt. 7000 ft., July 18, 1910 (G). WYOMING: *L. O. & R. P. Williams 3028*, Big Horn Co., 10–15 miles east of Kane, west slopes of the mountains, alt. 8000 ft., June 19, 1936 (G); *Goodding 1971*, Carbon Co., Bridger

Peak, moist timbered flats, Aug. 24, 1903 (G); *L. O. & R. P. Williams 3639*, Park Co., Beartooth Lake, in pine woods, alt. 9000 ft., July 21, 1937 (G); idem *3552*, Crazy Woman Creek, July 14 (G); *E. B. & L. B. Payson 2999*, Sublette Co., Gros Ventre Mountains, 15 miles northeast of Bondurant, open slopes, Aug. 13, 1922 (F, G, US); *Williams & Pierson 652*, Teton Co., vicinity of Hoback Canyon, spring-bank, alt. 7000 ft., June 19, 1932 (CA, G). NEVADA: *Nelson & Macbride 1936*, Elko Co., Jarbridge, aspen copses, alt. 7000 ft., July 6, 1912 (G, NY); *Nelson & Macbride 2210*, Elko Co., Mountain City, aspen copses, alt. 7000 ft., Aug. 14, 1912 (G, NY, US); *Maguire & Piranian 15,523*, along Ole Creek, woodlands, June 28, 1934 (G). OREGON: *L. S. Rose 36,476*, Wallowa Co., 1 mi. s. Wallowa Lake, alt. 4600 ft., July 18, 1936 (CA); *Thompson 13,340*, Baker Co., near Cornucopia, rocky slopes of Wallowa Mts., July 18, 1936 (ANS, NY); *Henderson 5454 & 5658*, E. Grant Co., Austin Ranch, 1925 (CA, G); *Nuttall*, Columbia Woods (ANS, G, NY) with *Thalictrum heterophyllum* in Nuttall's handwriting). WASHINGTON: *Piper 2022*, Mt. Rainier, rich meadows, alt. 6500 ft., Aug. 1–15, 1895 (G, isotype of *T. rainierense*); *Piper*, Walla Walla Co., Blue Mts., along streams in woods, July 17, 1896 (G, ISOTYPE of *T. occidentale* var. *palouense*); *Thompson 6945*, Okanogan Co., moist shaded slopes by road to Salmon Meadows, alt. 3500 ft., June 25, 1931 (G); *Thompson 7793*, Chelan Co., Wenatchee Mts., below Stuart Pass, moist alder groves, alt. 4500 ft., July 27–31, 1931 (ANS, G). BRITISH COLUMBIA: *J. M. Macoun 33,606*, Tami Hy Mt., Chilliwack Valley, alt. 5000 ft., July 30, 1901 (G-ND, type of *T. propinquum*); *Heacock 53*, Emerald Lake, Avalanche Path, alt. 4400 ft., June 29, 1904 (G, NY, US, paratypes of *T. propinquum*); *Shaw 970*, in the Big Bend district, about 118° 20′ W., 51° 45′ N., alpine meadow, alt. 6000, July 24, 1905 (G, NY); *McCabe 4924*, Elk River Road, 17 miles north of Natal, edges of openings of green spruce timber, Sept. 8, 1937 (UC); *Raup & Abbe 3867*, along Wicked R., near the Peace, about 56° 4′ N., 123° 39′ W., open woods, July 18, 1932 (G). FIG. 101, a–e.

The type of *T. propinquum* Greene is not in the Herbarium of the Canadian Geological Survey as stated in the original description; similarly with the types of *T. tortuosum* Greene, *T. Mortoni* Greene and *T. glaucodeum* Greene. In his last letter to J. M. Macoun, Greene wrote:

April 28, 1915.

. . . . . .

Another parcel of your Thalictrum went last night; only a small parcel, of sheets on which I have some notes to make, remains.

. . . . . .

That "small parcel" apparently was never sent, for 66 of the numbers of the Herbarium of the Geological Survey which are represented in the herbarium at Notre-Dame University, are all missing in the National Herbarium of Canada.

Subsectio **Laminaria,** subsect. nov. *Plantae* persaepius plus minusve stoloniferae. *Carpella* matura valde compressa vel laminaria, *nervis* rugosis, haud costata, vel, si costata, costis acutis. Crassitudo carpelli a dimidiis latitudinis ejus recedit. Species typica *Thalictrum Fendleri* Gray sit.

a. Carpella haud reflexa, ovata ad lanceolata, viridia vel brunnea, plus minusve pubescentia vel interdum glabra, nervis lateralibus raro ramosis et sinuosis, nunquam minute sinuosis, nec anastomosantibus, reticulatis. Planta nunquam pruinosa nec caesia nec glauca. Cauli tamen interdum purpurascens. . . . *b.*
  b. Nervi laterales 3 conspicui. Planta pubescens. . . . . 102. *T. Fendleri.*
  b. Nervus lateralis solitarius vel, si ternatus, medius conspicuor et multo crassior quam duo alii. Plantae saepius glabrae. . . . *c.*
    c. Carpella ventre ca. 2.5 mm. longo. . . . *d.*
      d. Nervi haud sinuosi. . . . . 103. *T. Fendleri,* var. *Wrightii.*
      d. Nervus ventralis, licet alii, valde sinuosi. 104. *T. Fendleri,* var. *sinuosum.*
    c. Carpella ventre ca. 5 mm. longo. 105. *T. Fendleri,* var. *quadrinervatum.*

a. Carpella plura vel omnia reflexa, obovata vel semiobovata, plus minusve pruinosa glauca, nervis lateralibus saepius ramosis anastomosantibus reticulatis minute sinuosis. Planta glabra pruinosa et plus minusve glauca vel caesia. Ovaria ventre compresso orbiculari et nunquam rugoso. 106. *T. polycarpum.*

Practically, *T. polycarpum* Wats. is always glabrous while *T. Fendleri* Engelm. is always more or less pubescent, at least within the range of the former. Ovaries, fruits and under surface of upper leaves always show this character clearly. The fruits of these two species are endlessly variable. Some of these variations are more frequent in one part of the range, but they are liable to be found anywhere throughout the range and none of them is clearly cut from the other variations. However, three variations of *T. Fendleri* have a geographic range of their own and outnumber the intermediate forms.

102. T. FENDLERI Engelm. ex Gray, Pl. Fendl. 5, 1849. *T. Fendleri,* var. *platycarpum* Trel., Proc. Bost. Soc. Nat. Hist. **23:** 304, 1886. *T. platycarpum* (Trel.) Greene, Pittonia, **1:** 166, 1888, nec. *T. platycarpum* Hook. f. & Th., Fl. Ind. **1:** 13, 1855. *T. hesperium* Greene, Pittonia, **2:** 24, 1889. *T. polycarpum*

Wats., var. *hesperium* (Greene) Jepson, Fl. W. Midd. Cal. 202, 1901. *T. omissum* Greene, Fedde, Rep. Sp. Nov. **7:** 254, 1909. *T. stipitatum* Rydberg, Fl. Rocky Mts., 290, 1918, nec *T. stipitatum* Rose, Contrib. U. S. Nat. Herb. **8:** 28, 1903. *T. Fendleri*, var. *hesperium* (Greene) Jepson, Fl. Calif. **1:** 530, 1921. *Planta* pubescens, raro subglabra vel glabra etiam, nunquam pruinosa nec caesia nec glauca, *caulis* tamen interdum purpurascens, 60–150 cm. *Radix* plus minusve stolonifera. *Sepala* erosa, floris maris ovata vel elliptica 3–5 mm. longa, foeminei ovata vel rhomboidea vel late lanceolata (1.0)–1.5–(2.0) mm. longa. *Filamenta* 4.0–7.5 mm. lutea. *Antherae* oblongae vel lineares, luteae, 2.2–3.4 mm., *acumine* 0.1–0.8 mm. *Stigma* 1.5–4.0 mm. *Ovaria* dense viridia, ventro ovato ad lanceolato, saepius densissime pubescente. *Carpella* matura haud reflexa, ovata ad lanceolata, viridia vel brunnea, plus minusve pubescentia vel interdum glabra, *stipite* (0.1)–0.5–(2.0) mm., ventre 2.7–9.0 mm. longo, 1.8–4.5 mm. lato, *nervis* lateralibus raro ramosis et sinuosis, nunquam minute sinuosis, nec anastomosantibus, nec reticulatis, nervo ventrali convexiore quam dorsali. Floret ab Aprili ad Septembrem.—TEXAS: *Ferris & Duncan 2569*, Jeff Davis Co., Davis Mts., Livermore Peak, July 9–12, 1921 (CA, M); *Havard 138*, Jeff Davis Co., Limpia Mts., July, 1883 (G); *Moore & Steyermark 3566*, Culbertson Co., Guadalupe Mountains, McKittrick Canyon, shaded rocky woodland, alt. 2000 m., July 22, 1931 (G, M). WYOMING: *Tweedy 4244*, Carbon Co., forks Battle Creek, alt. 7200 ft., Aug. 15, 1901 (US, type of *T. omissum;* NY, isotype); *A. Nelson 7660*, Albany Co., Tie City, in a cañon, July 20, 1900 (G); *Payson & Armstrong 3603*, Lincoln Co., Alpine, on the Snake River near the Idaho boundary, Wolf Creek, aspen groves, July 25, 1923 (G). COLORADO: *Hall & Harbour 8*, lat. 39°–41°, 1862 (BC, G, M); *E. L. Greene 593*, Golden City &c., 1871 (G, paratype of *T. Fendleri*, var. *platycarpum*); *F. E. & S. S. Clements 243*, El Paso Co., Minnehaha, alt. 2600 m., 1 julii, 1901 (NY, type of *T. stipitatum;* G, isotypes); *Baker, Earle & Tracy 343*, Montezuma Co., W. La Plata Mts., Chicken Creek, common, alt. 9000 ft., July 6, 1898 (G); *Rollins 1808*, Las Animas Co., 26 miles northwest of Trinidad, 2 miles north of the Pergatore River, dry hillside, stems single, alt. 7500 ft., July 3, 1937 (G); *Churchill*, Clear Creek Co., Brookvale, Bear Creek Canyon, June 17, 1918 (G); *Hermann 5399*, Garfield Co., Trapper's Lake, n. shore, open spruce-fir grove, alt. 9500 ft., July 29, 1933 (G). UTAH: *M. E. Jones 1194*, Salt Lake Co., Wahsatch Mts., Alta, alt. 10,000 ft., Aug. 5, 1879 (CA); *Goodman & Hitchcock 1391*, San Juan Co., Abajo Mts., n. slope, beside small stream, alt. 8500–11,000 ft., July 1–2, 1930 (CA); *E. B. & L. B. Payson 4883*, Summit Co., foothills of Uinta Mts., near Mill Creek, dry clay slope, alt. 8200 ft., July 4, 1926 (G, US);

McKelvey 4204, Washington Co., Zion Natl. Park, Zion Cañon, alt. 4000–5000 ft., May 7, 1934 (G). NEVADA: *Clokey 5462*, Clark Co., Lee Cañon, gravelly flat, with *Pinus scopulorum* and *Populus aurea*, alt. 2670 m., Aug. 1, 1935 (CA, G, UC); *M. E. Jones*, Humboldt Co., East Humboldt Mts., alt. 10,000 ft., Aug. 13, 1897 (UC); *P. B. Kennedy 1923*, Washoe Co., Hunter Creek, elev. 6000 ft., Aug. 2, 1912 (CA, G); *Baker 1323*, Ormsby Co., head of Fall Creek, alt. 2460 m., July 15, 1902 (G, NY). NEW MEXICO: *Standley 4257*, Pecos River National Forest, Windsor Creek, alt. ca. 8600 ft., July 8, 1908 (G, M); *Wright 1851* [Wright's mss.: *151*, Grant Co., hillsides of Coppermine Creek, 2–4 ft. tall, Aug. 4] (G, NY, US); *Metcalfe 248*, Socorro Co., Mogollon Mts., on Mogollon Creek, alt. ca. 8000 ft., July 17, 1903 (G, M, UC, C-UC); *Wooton 228*, Lincoln Co., White Mts., alt. 6300 ft., July 28, 1897 (M, UC); *Fendler 13*, 1847 [Fendler's mss.: 13, Santa Fe, Creek-valley, shady places, margin of irrigation ditches at the foot of perpendic. rocks, 13th June–1st July in flower, 19th July in fruit. Flowers dioecious] (G, TYPE and ISOTYPES of *T. Fendleri;* ANS, M, NY, ISOTYPES); *J. M. Bigelow 963*, San Antonita, Camp B, mt. arroyos, Oct. 9, 1853 (G, NY, US, paratypes of *T. Fendleri* var.? *polycarpum*). ARIZONA: *Blumer 3309*, Rincon Mountains, Spud Ranch, rocky places, alt. 2260 m., Aug. 23, 1909 (G, M, UC); *M. E. Jones 24,850*, Huachuca Mountains, Ramsay Cañon, Sept. 28, 1929 (CA, G, M, UC); *Eastwood 5652*, Grand Canyon of the Colorado River, June 15, 1916 (G); *Wolf 2450*, Gila Co., 10 miles northwest of Pine, July 1, 1928 (CA, G); *Goodman & Payson 2841*, Apache Co., Luka-Chukai Mountains, damp steep slope of forest floor, alt. 2727 m., June 30, 1936 (G, M); *M. E. Jones 3969*, Flagstaff, Aug. 4, 1884 (CA, UC). CALIFORNIA: *Heller 11,669*, Butte Co., Jonesville, Aug. 8, 1914 (CA, G); *Mrs. R. M. Austin 146*, Butte Co., Colby, July, 1896 (M, UC, US, paratypes of *T. fissum*); *S. B. & W. F. Parish 1483*, San Bernardino Mts., [San] Ber[nardino] Valley, Aug., 1882 (G, type of *T. Fendleri* var. *platycarpum;* US, isotype); *Greene 452*, high Sierra, in cold wet shade near snow, Oct. 14, 1874 (G, paratype of *T. Fendleri* var. *platycarpum*); *Kellogg & Harford 3*, Oakland Hills, March 1, June 6, 1868–1869 (G, paratype of *T. Fendleri* var. *platycarpum*); *Heller 6679*, Monterey Co., on the Salinas Road, near Del Monte, May 5, 1903 (G, M, UC, US); *Munz & Johnston 8696*, San Bernardino Co., 1 mile south of Oak Glen, alt. 4500 ft., July 17, 1924 (G); *Lemmon*, San Bernardino Co., woods near Grayback, July, 1879 (G, paratype of *T. Fendleri* var. *platycarpum*); *A. Gray*, Santa Barbara, Feb.–May, 1885 (G, paratype of *T. Fendleri* var. *platycarpum*); *Coulter* (G, US, paratypes of *T. Fendleri* var.? *polycarpum*). OREGON: *Cusick 2036a*, Eastern Oregon, 1898 (G); *Eastwood & Howell 1614*, Lane Co., McKenzie Highway, near Blue River,

Apr. 17, 1934 (CA); *Constance*, Lane Co., Eugene, Young's Grove, Apr. 12, 1924 (G); *Henderson 9057*, Harney Co., Stein Mts., above Fish Lake, in aspen woods, alt. 6500 ft., July 20, 1927 (CA); *M. E. Peck, 14,202*, Stein Mts., above Alberson, along stream, alt. 7000 ft., July 4, 1925 (ANS). MEXICO, BAJA CALIFORNIA: *Orcutt*, n. Lower Cal., Topo Cañon Mts., July 30, 1883 (F). FIG. 102, a–e.

Trelease did not authenticate every *Thalictrum* he saw at the Gray Herbarium where he prepared his monograph of the genus; only four herbarium sheets bear his identification. These are the specimens he cited as *T. venulosum*. On about half a dozen other sheets are to be found pockets containing a smaller pocket on which he briefly copied out the label of the specimen, probably in order to be able to replace those pockets where they belong after the drawings were made, for these pockets contain dissected fruits, presumably the very ones from which the illustrations of his monograph were drawn.

It seems that, at the Gray Herbarium, Dr. B. L. Robinson went over Trelease's work, wrote the new species-covers needed and pasted all the revision labels as Trelease would have done, for all the names written by Robinson on sheets or covers in the genus *Thalictrum* are in perfect accordance with Trelease's treatment of that genus. Nearly all of the *Thalictra* bearing a revision label in Robinson's handwriting were collected prior to 1886. Very few indeed of the specimens collected after that date were revised by Robinson. The later specimens were obviously not accessible to Trelease for his monograph. Furthermore, a few specimens might have been collected prior to 1886, but mounted and revised by Robinson only later on. These can not be distinguished from those Trelease had on hand in 1886, and they introduce some uncertainty as to the correspondence of Robinson's labels with Trelease's opinions in the genus. However, in the absence of any better criterion, the revision of the former has been considered as representing the opinion of the latter, provided the specimens were collected prior to 1886 in a locality within the range given by Trelease in his monograph of that year.

There is no authenticated specimen of *T. Fendleri*, var. *platycarpum* Trel. except for one specimen from the Smithsonian Institution which bears the following note in Trelease's handwriting: "*T. Fendleri v. platycarpum or nearly that*", but six

specimens at the Gray Herbarium bear a revision-label in Robinson's handwriting, stating that these are *T. Fendleri* Englm., var. *platycarpum* Trel. All six are from California and were collected in or before 1885. In view of this variety having been published in 1886 with California given as its range, it seems likely that these labels represent Trelease's opinion rather than Robinson's. The TYPE was selected from among these six specimens. It bears in a pocket a fruit dissected by Trelease and this apparently is the very fruit from which he made the drawing he published to illustrate *T. Fendleri* var. *platycarpum* in the paper where he published that variety. A drawing was made of this fruit (our fig. 102d) and one can not fail to note some similarity of pattern of this drawing to Trelease's drawing. Such sinuose lateral nerves are rather exceptional in *T. Fendleri*.

103. T. FENDLERI Engelm. var. WRIGHTII (Gray) Trel., Proc. Bost. Soc. Nat. Hist. **23:** 304, 1886. *T. Wrightii* Gray, Pl. Wright. **2:** 7 (269), 1853. *Planta* saepius glabra, omnibus partibus minor, haud stolonifera, (25)–50–(90) cm. *Stigma* ca. 1.5 mm. *Carpella* matura ovata ca. 2.5 mm. longa, *nervis* haud sinuosis, nervo dorsali convexo, ventrali convexiore quam dorsali. Nervus lateralis singulus, vel, si ternati, nervus medius conspicuor et multo crassior quam duobus aliis intermediis. Floret Augusto et interdum Julio vel Septembri.—ARIZONA: *M. E. Jones*, Santa Rita Mts., alt. 4500 ft., Aug. 24, 1903 (CA, UC); *Darrow & Arnold*, Santa Rita Mts., alt. 5500 ft., Aug. 23, 1936 (UC); *Harrison & Kearney 8907*, Santa Rita Mts., Aug. 20, 1932 (US). MEXICO, CHIHUAHUA: *Barlow*, Sierra Madre, ridge between Rio Chico and Rio Caballo, Sept. 30, 1911 (F); *Pennell 18,918*, Sierra Gazachic, Barranca Colorada, 35 km. southwest of Minaca, dry rocky ledges, herb, alt. 2200–2400 m., Sept. 16–17, 1934 (ANS); *LeSueur 1211*, Chuchichupa, Aug., 1936 (F); *Pringle 1131*, Potero Mts., alt. 7300 ft., Sept. 10, 1886 (G); *Hartman 788*, Pilares, "Culantrio", Sept. 19, 1891 (G); *Pringle 1180*, near Chihuahua, cool hillsides, Aug. 26, 1887 (ANS, F, G, NY, US). SONORA: *Hartman 121*, Los Pinitos, alt. 6100 ft., Oct. 12, 1890 (G, NY, US); *Wright 834*, mountain ravine at Santa Cruz, Sept., 1851 (G, TYPE; ANS, G, M, NY, UC, ISOTYPES); *Mearns 1605*, summit of San Jose Mts., Aug. 3, 1893 (US); *S. S. White 3081*, Cañon de las Estacas, July 30, 1940 (G). SINALOA: *Pennell 20,103*, Cerro de la Sandia, northeast of Panuco, Carrizo, along stream on pineland, alt. 1800–1900 m., Aug. 29–30, 1935 (ANS); *Gentry 6266*, Sierra Surotato, Ocurahui, Pine Forest area, steep moist shady canyon slope with mixed dominants, alt. 6000–7000 ft., Sept. 1–10, 1941 (ANS, M, NY). FIG. 103.

The number 834 in the manuscript of Wright is an *Artemisia*. But it is known that Gray changed Wright's collection-numbers. The manuscript of the latter enumerates three collections of *Thalictrum:*

178. *Thalictrum*, Cummings' Creek, May 10, 1849.[1]
151. *Thalictrum*, hillsides of Coppermine Creek, 2–4 ft. tall, Aug. 4, 1851.[2]
639. *Thalictrum*, Mountain ravines at Santa Cruz, Sept. 23, 1851.[3]

At the Gray Herbarium there are three herbarium sheets of Wright's collections. The labels read as follows (Gray's handwriting is in italics, the printed caption in roman):

First specimen:

debile, Buckley ?
Thalictrum (n. sp.)
debile, Buck
Texas, Mr. Charles Wright.

Second specimen:

No. *833* C. Wright, Coll. N. Mex. 1851.
Thalictrum Fendleri, Engelm.

Third specimen:

No. *834* C. Wright, Coll. N. Mex. 1851.
Thalictrum Wrightii n. sp.
Santa Cruz, Sonora.

Comparing these with what Gray published in Pl. Wright. **2:** 7 (269), 1853, it seems clear that these three specimens correspond respectively to Wright's field numbers 178, 151, 639.

104. T. FENDLERI Engelm., var. **sinuosum,** var. nov. *Planta* similis praecedenti, fructubus tamen *nervis* sinuosis. Floret Augusti mense.—MEXICO, CHIHUAHUA: *Goldman 125*, near Parral, alt. about 6500 ft., Sept. 20, 1898 (G, US). DURANGO: *Pringle 13,701*, Sandia Station, Oct. 12, 1905 (G, US); *Pennell 18,443*, north of Cueva, Metates, ravine at waterfall, alt. 2600–2650 m., Aug. 29–30, 1934 (ANS); *Nelson 4749*, El Oro to Guanacevi, Aug. 14–16, 1898 (G, TYPE and ISOTYPE: US, ISOTYPES). SAN LUIS POTOSÍ: *Schaffner 26*, ex convalli San Luis Potosí, in sylvis montibus San Miguelito, 1876 (G). FIG. 104.

[1] According to a manuscript at the Gray Herbarium (Johnston, I. M., Field Notes of Charles Wright, 1940), this is in Fayette County, Texas.
[2] Eodem. Grant County, New Mexico.
[3] Eodem. Sonora, Mexico.

105. T. FENDLERI Engelm., var. **quadrinervatum,** var. nov. *Planta* pubescens verosimiliter metrum superans. *Stigma* ca. 1.5 mm. *Carpella* matura ventro ca. 5 mm. longo et ca. 2.5 mm. lato, *nervis* rectis vel sinuosis, ventrali convexiore quam dorsali. Nervi laterales carpelli vel tres vel singulus in utroque latere. Si tres, intermedius quam duo alii multo conspicuor et crassior est. *Flores* ignoti.—MEXICO, BAJA CALIFORNIA: *Wiggins & Demaree 4941*, Sierra San Pedro Martir, La Encantada, margins of meadow and adjacent slopes, alt. 2200 m., Sept. 20, 1930 (G, TYPE; F, NY, UC, US, ISOTYPES). FIG. 105.

106. T. POLYCARPUM (Torr.) Watson, Proc. Am. Acad. **14:** 288, 1879, nec *T. polycarpum* Loret, Bull. Soc. Bot. Fr. **6:** 16, 1859, ut nomen provisorium alternativumque editum. *T. Fendleri* Engelm., var.? *polycarpum* Torr., Pac. R. R. Rep. **4:** 5 (61), 1857. *T. caesium* Greene, Fl. Franc. **3:** 309, 1892, nec *T. caesium* Blocki, Oest. Bot. Zeitschr. **37:** 286, 1888. *T. bernardinum* Greene, Fedde, Rep. Nov. Sp. **7:** 252, 1909. *T. campylopodum* Greene, l. c. 253, 1909. *T. coreospermum* Greene, l. c. 1909. *T. lentiginosum* Greene, l. c. 1909. *T. papyraceum* Greene, l. c. 1909. *T. ametrum* Greene, Muhlenbergia, **5:** 129, 1909. *T. latiusculum* Greene, l. c. 130, 1909. *T. magarum* Greene, l. c. 1909. *T. mendocinum* Greene, l. c. 129, 1909. *T. leiocarpum* Greene, l. c. 130, 1909, sicut nomen provisorium et alternativum praecedenti editum, nec *T. leiocarpum* Fries, Linnaea, **29:** 731, 1857 sive 1858. *T. polycarpum* Wats. var. *caesium* (Greene) Jepson, Fl. Calif. **1:** 530, 1921. *Planta* stolonifera omnino glabra, saepissime cauli, ramis, ramulis, fructubusque pruinosis vel glaucis vel caesiis, 50–150 cm. *Sepala* floris maris elliptica 3–5 mm. longa, foeminei orbicularia vel ovata vel saepius late ovata 1.0–2.5 mm. longa. *Filamenta* 5–6 mm. Antherae 2–4 mm., *acumine* 0.1–0.5 mm. *Stigma* 1.5–4.0 mm., filiforme. *Carpella* matura reflexa et valde compressa, nunquam costata, *stipite* (0.1)–0.2–(1.0) mm., ventre oborbiculari vel obovato-lanceolato vel saepius obovato 4–6–(8) mm. longo et (2.2)–3.5–(4.5) mm. lato, *nervis* lateralibus valde sinuosis ramosis anastomosantibusque, nervo ventrali interdum gibboso et semper quam dorsali convexiore. Floret Martio Aprili Majo et Junio.—CALIFORNIA: *Chesnut 33*, Mendocino Co., Round Valley, alt. 440 m., May 20–June 20, 1898 (US, type of *T. mendocinum*); *Hasse*, Los Angeles, cañons, copses, Apr. 7–May 20, 1892 (US, type of *T. lentiginosum;* NY, isotype); *Heller 5855*, Lake Co., foothills of Mt. Sanhedrin, midway between Potter Valley and Hullville, July 14, 1902 (US, type of *T. latiusculum;* ANS, F, G, M, NY, isotypes); *S. B. Parish 3469*, San Bernardino Co., San Bernardino Mountains, Waterman Cañon, alt. 2000 ft., June 29, 1894 (US, type of *T. bernardinum;* M, isotype); *Orcutt*, Cuyamaca Mts., July, 1889 (US, type of *T.*

coreospermum); *Alderson*, San Diego Co., Witch Creek, April, 1894 (G-ND, type of *T. magarum;* G, photo of type); *Greene*, Chico, June, 1889 (G-ND, type of *T. caesium;* G, photograph of the type; UC, NY, isotypes); *L. E. Smith 306*, Shasta Co., Pitt River, May 28, 1913 (CA); *Bidwell*, Chico, Apr., 1879 (G); idem, May, 1878 (G); *Mrs. R. M. Austin*, Plumas Co., 1877 (G); *G. R. Vasey*, Sancelito, 1876 (G) [These last four specimens were authenticated by Watson]; *J. M. Bigelow*, Napa Valley, 1853–1854 (G, TYPE of *T. Fendleri* var.? *polycarpum;* NY, ISOTYPE). OREGON: *J. Howell*, Tualitin Plains, damp shady woods, along creek, July, 1877 (G); *J. Howell*, Sauvie's Island, July 1877 (F, type of *T. papyraceum*); *T. Howell*, along wooded streams, June 1881 (ANS, F, isotypes of *T. campylopodum*); *J. C. Nelson 1113*, Polk Co., W. Salem, woods near river, May 8, 1817 (G); *Eastwood & Howell 1487*, Douglas Co., 4 miles n. of Oakland, Apr. 13, 1934 (CA); *J. C. Nelson 2701*, Marion Co., State School, low ground, June 21, 1919 (G); *T. Howell*, Washington Co., by creeks, May, 1880 (F); idem, May, 1881 (ANS). FIG. 106, a–c.

The validity of *T. polycarpum* Wats. against the earlier *T. polycarpum* Loret has been argued pro and con many times. First, Greene noticed that there were two species called *T. polycarpum* and proposed the name *T. ametrum* to supersede *T. polycarpum* Wats. See Muhlenbergia, **5:** 129, 1909.

Second, L. C. Wheeler pointed out that *T. polycarpum* Loret, being a "nomen provisorium", was not validly published and thus could not invalidate a later homonym. Hence *T. polycarpum* Wats. was the correct name for the plant discussed. See RHODORA, **40:** 319, 1938. Third, Leon Croizat in Madroño, **7:** 1, 1943, in an article which I find much harder to follow through than Loret's "stiff french", contested the following points: 1, that it has not been made clear yet which of Loret's names, *T. polycarpum* and *T. multiflorum*, is a "nomen provisorium". 2, that *T. polycarpum* Loret was published as a synonym of *T. multiflorum* Loret, hence it is invalid (Amsterdam Code, Art. 40). 3, that *T. polycarpum* Loret is illegitimate, invalid, has been treated as a synonym on taxonomic grounds, and is an earlier homonym. Thus, according to Article 61, it renders illegitimate *T. polycarpum* Wats.

To this one may answer: 1, that both *T. multiflorum* Loret and *T. polycarpum* Loret are "nomina provisoria". If not, what is the meaning of "nomen provisorium"? There does not exist yet any officially published definition of that term, but in the

meantime we will take it in its common, everyday sense, hoping that it will not turn out that the 1935 International Congress had some esoteric meaning in mind. 2, that *T. polycarpum* Loret was not published as a synonym of *T. multiflorum* Loret, but as a "nomen alternativum". As ruled by the 1935 Congress, when names are published as "nomina alternativa" that does not render them invalid, but they are invalid if published as "nomina provisoria". Hence both *T. polycarpum* Loret and *T. multiflorum* Loret are not validly published. See Journ. Bot. **74:** 75, 1936. 3, that Article 61 mentions 4 conditions as necessary, that a homonym might be invalidated by another homonym, namely, that a homonym must be "*previously* and *validly* published for a group of the *same rank* based on a *different type* [italics mine]". *T. polycarpum* Loret does not fulfill the second of those conditions. Hence it cannot render *T. polycarpum* Wats. illegitimate. Article 61 speaks of "illegitimate names" and of names "treated as synonyms on taxonomic ground" only to specify that those two qualities are of no effect in the solution of the problem.

4 and 5, Cronquist and Weatherby, in two different articles published on the same page, both pointed out that "nomina provisoria" have been ruled out as not being validly published, and that the other half of Article 61, cited by Croizat, explicitly states that an earlier homonym must have been validly published in order to invalidate a later homonym. Now, Croizat himself admits that *T. polycarpum* Loret was not validly published, hence there is no reason why we should not keep *T. polycarpum* Wats. (Madroño, **7:** 83, 1943).

The type of *T. Fendleri* Engelm., var. ? *polycarpum* Torr., is evidently not at New York, but at the Gray Herbarium. The text of the original description suggests that Coulter's plant should not be selected as a type. It is represented by two sheets, one at the Gray, the other at the National Herbarium, and both were originally labelled *T. dioicum* L. in John Ball's handwriting. The specimen at the Gray bears the following successive annotations in Gray's handwriting:

T. Fendleri
= *T. polycarpum* Torr. = *Fendleri* var.
T. polycarpum

Both specimens are densely pubescent individuals of *T. Fendleri* and they agree only in part with the original description of *T. Fendleri*, var. ? *polycarpum* Torr.

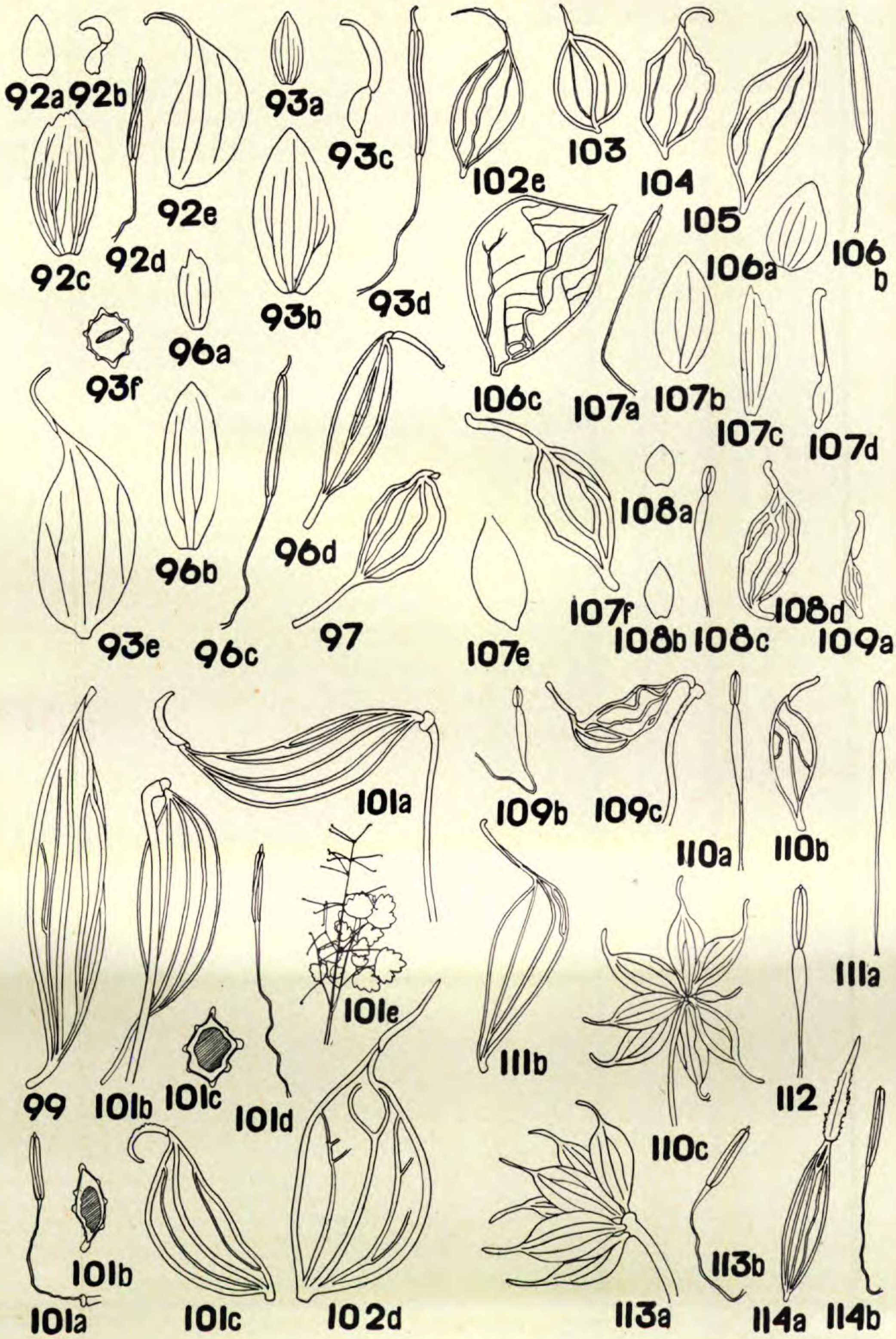
J. M. Bigelow's collection from San Antonita, New Mexico, is represented at the Gray Herbarium, at the New York Botanical Garden and at the Smithsonian Institution. All three are good ordinary *T. Fendleri* with a large, open and compound panicle and with pubescent fruits and leaflets. Although cited by Torrey, this collection does not agree at all with his description. The specimen at New York is labelled *Thalictrum Fendleri* Engelm. in Gray's handwriting and so is the specimen at the Gray Herbarium, but to this one Gray himself added later *fere var. Wrightii.* The third specimen is labelled *Thalictrum Fendleri* Engelm. in *Torrey's* handwriting. The New York sheet has the original label: *Camp B, San Antonita, Octo. 9, 1853, 963 Thalictrum sp., mt arroyos, JMB.*

At the Smithsonian Institution there is also a specimen of *T. polycarpum* which was first labelled *Thalictrum dioicum L. ?*, but Torrey changed it later to *polycarpum.* It was collected by E. Samuels in Sonoma Co., California. Although authenticated and agreeing with the original description, this specimen was not cited.

J. M. Bigelow's collection in Napa Valley is represented both at the Gray Herbarium and at the New York Botanical Garden. The New York specimen is identified *Thalictrum Fendleri* Engelm. in Torrey's handwriting. It is an immature pistillate plant. The label of the specimen at the Gray Herbarium reads as follows:

> *T. Fendleri. var.*
> **Thalictrum polycarpum**
> *Napa Valley Calif.* **n. sp. Torr.**
> Bigelow

Gray's handwriting is indicated by italics, Torrey's by boldface characters. This latter specimen is made up of a staminate inflorescence and a complete pistillate specimen with immature fruits. This Bigelow collection is very clearly *T. polycarpum* (Torr.) Wats. and agrees perfectly well with the original description of *T. Fendleri* Engelm. var.? *polycarpum* Torr. The specimen to be selected as a TYPE is evidently J. M. Bigelow's specimen at the Gray Herbarium, from the Napa Valley collection.



DETAILS OF FLOWERS OR FRUITS OF THALICTRUM, all × 4; except 101e, × ⅕, and 110c and 113a, these × 3.

(For explanation see end of paper.)

It is the only specimen which is at the same time cited, authenticated and agreeing well with the original description. It is also the most complete specimen and a well preserved one. This problem had already been outlined by L. C. Wheeler in Rhodora, **40:** 319, 1938, but no definite conclusion was given.

When Watson published his *T. polycarpum* he gave *T. Fendleri*, var.? *polycarpum* as a synonym "in part", without specifying which of Torrey's specimens were included. But the description of Watson eliminates both Coulter's and J. M. Bigelow's New Mexican collections; only the Napa Valley specimen agrees with the description. Thus *T. polycarpum* must be considered as a new status for *T. Fendleri* Engelm. var. ? *polycarpum* Torr. "in part *including the type specimen*" and there is no need to select a new type for *T. polycarpum*, but we must write *T. polycarpum* (Torr.) Wats.

L. C. Wheeler has expressed a different opinion in Rhodora, **40:** 317, 1938. To him it is not clear what of Torrey's variety Watson included in his species. He thus naturally comes to the conclusion that one must write *T. polycarpum* Wats. and must select the type of that species independently from the type of Torrey's variety. To this we may say that Torrey's variety included two different species but his and Watson's descriptions agree well only with the Napa Valley collection. Watson had all three syntypes at hand and could easily settle that point.

Anyhow, there are at the Gray Herbarium 5 collections of *T. polycarpum* (Torr.) Watson authenticated by Watson himself. All agree well with the description, are within the range given, and were collected from 1876 to 1879. As a matter of fact, all 5 labels are entirely in Watson's handwriting. If one should follow Wheeler's opinion, one of those 5 specimens should be taken as the type. There is ample choice: one specimen is made up of 2 staminate inflorescences, another of a pistillate inflorescence, a third one of two pistillate and one staminate inflorescence, a fourth is the upper half of a plant with fully mature fruits, and the fifth one, the best specimen, a nearly complete plant with also fully mature fruits. The latter is the only specimen cited by Watson. Its label reads as follows:

> *Thalictrum polycarpum*
> (*T. Fendleri*, var. *polycarpum*, Torr.)

Damp shady woods along creeks,
near Tualitin Plains, Oregon.
J. Howell, July 1877.

Oddly enough, Wheeler selected J. M. Bigelow's Napa Valley collection as the type of *T. polycarpum*, the very type of *T. Fendleri* Engelm. var. ? *polycarpum* Torr. I see no reason to write *T. polycarpum* Wats. rather than *T. polycarpum* (Torr.) Wats., if the type of both units is the same specimen.

Sectio **Leucocoma** (Greene), stat. nov. Subg. or Sect. *Leucocoma* Greene, Leaflets, **2:** 54 and 55, 1910, subdivisio subgenerica cui deest determinator ordinis. *Leucocoma* (Greene) Nieuwland, Am. Midl. Nat. **3:** 254, 1914, ut genus, nec *Leucocoma* Rydb. Fl. Rocky Mts. 108, 1917. *Plantae* haud stoloniferae, sed *radicibus* fibrosis et numerosis. *Flores* polygami, sexu variabiles modo mirabili. *Sepala* erosa maris majora. *Filamenta* alba in nonnullis clavata. *Antherae* fere ovoideae ad oblongo-lineares, pallido-fuscae, *apice* truncatae vel *acumine* brevi. *Stigma* breve plus minusve bialatum. *Carpella* pariete membranacea, paullum si vero compressa, sed *nervis* rugosissimis saepius simplicibus et ternatis in latere. Species typica *T. canadense* sensu Greene i. e. *T. polygamum* Muhl. sensu auctoris sit.

This section is represented from Labrador to British Columbia and also in Newfoundland, Saint-Pierre et Miquelon and in the United States except in Mississippi, California, Utah and Nevada.

A key to the species of the section is not a workable one if it takes into account the full variation of each species. With more than a thousand herbarium sheets at hand one finds that occasional specimens will agree with the species to which they belong but for one character. To take such specimens into account would render the description so full of *perhaps*, *sometimes*, *rarely*, *or*, *even*, that they would not be descriptions any more. The following keys and descriptions are built upon specimens which I consider typical.

Clavis ad flores masculos ferentia

a. Pubescentia pilorum capitatorum vel rarissime deest; antherae 1.6–2.8 mm.; foliolae coriaceae et margine plus minusve revoluto ..... 107. *T. revolutum.*
a. Pubescentia vel deest vel pilorum uniseriatorum ....*b.*
b. Antherae 0.5–1.4 mm.; filamenta apice dilatata sub antheris constricta ....*c.*

c. Foliolae minores saepe integrae 0.5–1.5 cm. longae. Plantae glabrae. Filamenta 3.0–5.0 mm.....*d.*
d. Filamenta rigida. Planta rigida.....108. *T. macrostylum.*
d. Filamenta debilia. Planta reclinans.....109. *T. subrotundum.*
c. Foliolae fere omnes apice trilobatae 1.5–4.0 cm. longae. Plantae saepius pubescentes. Filamenta 3.5–8.0 mm.....*e.*
e. Antherae ca. 1 mm.; pedunculi gracillimi. Inflorescentia paniculata. Filamenta 3.5–5.0 mm..110. *T. polygamum.*
e. Antherae ca. 1.2 mm.; pedunculi crassiusculi; filamenta 5.0–8.0 mm.; inflorescentia subcorymbosa 111. *T. polygamum*, var. *hebecarpum*
b. Antherae 1.5–3.2 mm.....*f.*
f. Antherae 1.5–2.5 mm. Plantae pubescentes....*g.*
g. Antherae 1.5–2.0 mm. Inflorescentia apice rotunda. 112. *T. polygamum*, var. *intermedium.*
g. Antherae 1.8–2.2 mm. Planta fastigiata foliolis coriaceis et margine revoluto. Inflorescentia apice acuta.....113. *T. dasycarpum.*
f. Antherae 2.2–3.2 mm. Plantae nonnunquam glabrae 114. *T. dasycarpum*, var. *hypoglaucum.*

CLAVIS AD FLORES FOEMINEAS FERENTIA

a. Foliolae glabrae saepe integrae 0.5–1.5 cm. longae....*b.*
b. Stigma (0.7–) 1.0 (–1.5) mm. Foliolae interdum integrae, saepius apice trilobatae, saepius coriaceae.....108. *T. macrostylum.*
b. Stigma 1.0–2.0 mm. Foliolae fere omnes integrae, saepius membranaceae.....109. *T. subrotundum.*
a. Foliolae ca. 2.5 cm. et saepius inferne pubescentes....*c.*
c. Foliolae inferne sicut carpella dense pubescentes pilis capitatis. Foliolae coriaceae margine revolutae...107. *T. revolutum.*
c. Pubescentia, si adest, pilorum uniseriatorum....*d.*
d. Inflorescentia paniculata apice acuta....*e.*
e. Foliolae coriaceae pubescentes. Stigma 2–3 mm. 113. *T. dasycarpum.*
e. Foliolae saepius membranaceae. Stigma 2.5–5.0 mm. 114. *T. dasycarpum*, var. *hypoglaucum.*
d. Inflorescentia apice rotunda vel subcorymbosa....*f.*
f. Inflorescentia subcorymbosa, pedunculis crassiusculis 111. *T. polygamum*, var. *hebecarpum.*
f. Inflorescentia paniculata.....110. *T. polygamum.* 112. *T. polygamum*, var. *intermedium.*

CLAVIS AD FRUCTUS FERENTIA

a. Carpella omnia valde stipitata, reflexa et nervis valde sinuosis. Foliolae 0.5–1.5 cm. longae, glabrae et integrae. Stigma ca. 1.5 mm.....109. *T. subrotundum.*
a. Carpella nulla reflexa, vel alia reflexa, alia radiata, alia ascendentia....*b.*
b. Carpella omnia ascendentia. Receptaculum ad basem capitis fructuum....*c.*
c. Carpella apice acuminata et incurvata nervis valde sinuosis; stigma ca. 1.0 mm.; foliolae glabrae, inferne albicantes, ca. 1 cm. longae.....108. *T. macrostylum.*
c. Stigma 2–3 mm. Plantae dense pubescentes et foliolis ca. 2.5 cm. longis.....113. *T. dasycarpum.*
b. Receptaculum ad centrum capitis fructuum. Carpella recta....*d.*

d. Pubescentia pilorum rigidorum capitatorum, rarissime deest. Foliolae coriaceae margine valde revoluto
107. *T. revolutum.*

d. Pubescentia saepius adest pilorum flexuosorum et uniseriatorum. Foliolae saepius membranaceae. . . . *e.*

e. Inflorescentia subcorymbosa pedunculis crassiusculis. Carpella ventre saepius oblanceolato
111. *T. polygamum*, var. *hebecarpum.*

e. Inflorescentia paniculata. . . . *f.*

f. Venter carpelli saepius lanceolatum, nervo ventrali convexiore quam dorsali
114. *T. dasycarpum*, var. *hypoglaucum.*

f. Venter carpelli ovatum vel obovatum vel ellipsoideum vel lanceolatum, stipite 0.2–0.5 (–1.0) mm.
110. *T. polygamum.*
112. *T. polygamum*, var. *intermedium.*

107. T. REVOLUTUM DC. Syst. **1:** 173, 1817, nec *T. revolutum* Lievre, Oestr. Bot. Zeitschr. **23:** 254, 1873. *T. revolutum* DC., var. β *subglabrum* DC. Syst. **1:** 178, 1817. *T. purpurascens*, var. *ceriferum* Austin ex Gray, Man. Bot., ed. **5:** 39, 1867. *T. aristatum* Willd. ex Lec., Bull. Soc. Bot. Belg. **24:** 253, 1885, nomen. *T. graveolens* Muhl. ex Trel., Proc. Bost. Soc. Nat. Hist. **23:** 301, 1886, ex synonymis. *T. Cornuti* L., var. *macrostylum* Shuttlw. in Small & Heller, Mem. Torr. Bot. Club, **3:** 8, 1892, ut synonymon editum. *T. Cornuti* L., var. *brevifolium* Rugel in Small & Heller, l. c. 9, 1892, nomen ut synonymon editum nec *T. Cornuti* L., var. *brevifolium* Shuttlw. in Gray, Syn. Fl. North Am. **1,** part 1: 17, 1895. *T. amabile* Greene, Am. Midl. Nat. **2:** 294, 1912. *T. revolutum* DC., f. *glabra* [sic] Pennell, Bartonia, **12:** 12, 1931. *Planta* circa metralis, fere semper pubescens per foliolas inferne, sepala, pedunculos et ovaria. Aliter semper glabra. *Foliolae* coriaceae margine valde revoluto, saepius obovatae, *apice* trilobatae, *lobis* saepius rotundis. *Sepala* ovata vel oblanceolata 3–4 mm. longa, floris foeminei 2.0–3.5 mm. longa. *Filamenta* debilia paululum apice incrassata, sub antheris haud constricta interdum subclavata, 4.5–5.5 mm. *Antherae* oblongo-lanceolatae ad oblongo-lineares 1.7–2.8 mm., *acumine* 0.2–0.5 mm. *Stigma* 2.0–3.5 mm. alis saepius conspicuis et pilis minutissimis, in fructu saepius incurvatum. *Carpella* matura *stipite* 0.2–0.5 mm., ventre ellipsoideo ad lanceolato. *Receptaculum* ad centrum capitis fructuum. Floret ad meridiem Majo, sed ad Septentrionem et in montibus floret Junio vel interdum Julio.—QUEBEC: *J. Macoun 72,578*, Gaspé Co., Percé, Aug. 30, 1907 (C, G). MASSACHUSETTS: *Fernald & Weatherby 16,807*, Barnstable Co., Falmouth, roadsides in woods north of Wood's Hole, Sept. 20, 1918 (NE); *Rich*, Middlesex Co., Stoneham, rocky woods, June 18, 1894 (NE); *W. Boott*, south end of Mystic Pond, wood, July 4, 1869 (G); *Pease 3782*, Essex Co., N. Andover, Boston Hill, dry pastures, June 28, 1904 (NE). RHODE ISLAND: *J. F. Collins*, Providence, n. of Cat Swamp, June 26, 1892 (G);

Lownes & Collins, Washington Co., South Kingston, July 11, 1930 (NE); *Fernald 9518*, Providence Co., Lincoln, Wilbur Crossing, dry thicket, July 17, 1913 (NE). CONNECTICUT: *Weatherby 6779*, Tolland Co., Somers, roadside thicket, June 22, 1935 (NE); *Bissell 54*, Hartford Co., Southington, dry rocky ground, frequent, June 15, July 10, July 30, 1893 (NE); *Woodward*, Franklin, dry bank, June 24, 1911 (G). NEW YORK: *Muhlenberg 795* (ANS); *Eames, Randolph & Wiegand 12,062*, Ontario Co., Phelps-Waterloo townline, Sept. 6, 1919 (G); *Burnham*, Warren Co., Lake George village, Sept. 3, 1897 (G); *House 25,018*, Albany Co., so. of Kamer, sand plains, Aug. 24, 1937 (NY). NEW JERSEY: *Austin*, Closter, June 5–15 (G, type of *T. purpurascens* var. *ceriferum*); *Austin*, Closter, 1866 (G, paratype of *T. purpurascens* var. *ceriferum*); *Austin*, Ne. New Jersey, uplands (G, paratype of *T. purpurascens* var. *ceriferum*); *Austin*, Palisades, 1858 (G, F); *Austin*, Closter, June, 1865 (F, paratype of *T. purpurascens* var. *ceriferum*). PENNSYLVANIA: *Pennell 8956*, Chester Co., Nottingham, serpentine barren, Sept. 14, 1916 (ANS, paratype of *T. revolutum*, f. *glabrum*); *Small*, Perry Co., vicinity of Marysville, June 25, 1888 (F); *Schweinitz*, Bethlehem (ANS); *Meredith*, Bucks Co., 1½ miles west of Union School House, open hedge-row, May 30, 1921 (G); *Muhlenberg 598* (Willdenow Herb., paratype of *T. polygamum* ?) DELAWARE: *Commons*, near Centreville, banks of streams, July 5, 1872 (ANS). MARYLAND: *J. D. Smith*, Garrett Co., Oakland, copses, borders of glades, July 13, 1883 (G). DISTRICT OF COLUMBIA: *Steele*, Chain Bridge flats, July 4, 1904 (US); *L. F. Ward*, June 23, 1878 (F, NY). WEST VIRGINIA: *Millspaugh 336*, 1890–1899 (F); *Gilbert 482*, Cabell Co., Pleasant Valley, open oak woods, July 8, 1936 (G, NY); *Core*, Monongalia Co., near Halleck, July 11, 1931 (G). VIRGINIA: *Fernald & Long 11,835*, Greensville Co., Emporia, rich deciduous wooded slope, May 11, 1940 (G); *Small*, Smyth Co., Walker Mountains, Shannon Gap, alt. 3000 ft., June 20, 1892 (F, G, M); *Churchill*, Rockbridge Co., Glasgow, June 1, 1891 (M). NORTH CAROLINA: *Small & Heller 264*, on the road between Blowing Rock and Shull's Mill, June 16–17, 1891 (ANS, F, M, NY, US); *Churchill*, Polk Co., Tryon, open hillsides, May 22, 1899 (M); *Churchill*, Madison Co., Hot Springs, June 1, 1899 (M). SOUTH CAROLINA: Saint Andrews, May, 1855 (G); *B. E. Smith*, Darlington Co., Lauther's Lake, low land, Aug. 3, 1940 (NC); *House 2225*, Oconee Co., Fort Hill, May 24, 1906 (BG, M, US). GEORGIA: *Leeds 2013*, Lumpkin Co., Blood Mt., Flatrock Gap, moist edge of exposed rock slide, June 2, 1934 (ANS); *Cuthbert 516 & 551*, Augusta, May 17, June 18, 1901 (NY); *Pollard & Maxon 521*, Dougherty Co., vicinity of Albany, Aug. 13, 1900 (G, US); *Churchill*, Chickamauga Park, near Lookout Mountain, May 8, 1906 (G, M); *Green*, Macon

(ANS, labelled *T. Cornuti*, var. *brevifolium* Rugel and paratype of *T. macrostylum*). FLORIDA: *Chapman* (G, NY); *Rugel*, prope St. Marks, inter frutices (Magnolia-Chamaerops), jun. 1843 (NY, labelled *T. Cornuti* var. *macrostylum* and paratype of *T. macrostylum*). ONTARIO: *J. Macoun 23,615*, Amherstburg, July 31, 1901 (G). OHIO: *Wilkinson 228*, Mansfield, waste places, June, Aug., 1895 (US, type of *T. amabile*); *Moseley*, Erie Co., Perkins, July 8, 1895 (G); *Lea*, Hamilton Co., June 14, 1838 (ANS). INDIANA: *Peattie*, Porter Co., Tremont, sandy field and along roads in the dunes, Sept. 4, 1920 (G). KENTUCKY: *Smith & Hodgdon 3865*, Monticello, Beaver Creek, rich wooded slopes, July 12–14, 1937 (G); *Short*, Lexington (ANS); *McFarland & James 5*, Whitley Co., 3 miles west of Corbin, low swampy field near edge of ditch, July 25, 1941 (M). TENNESSEE: *Ruth 1803*, Knoxville, groves and open woods, June, 1897 (NC, NY); *Svenson 10,564*, Cheatham Co., Pegram, dry shale, Aug. 22, 1940 (BG); *Eggert*, Dickson Co., near White Bluff, Aug. 19, 1897 (M). ALABAMA: *Eggert*, De Kalb, Collinsville, June 29, 1897 (M). ILLINOIS: *Gleason 9131*, Champaign Co., Champaign, wet prairie along railway, July 3, 1940 (NY); *Gleason*, Urbana, wet woods, June 27, 1906 (G); *Greenman 3683*, vicinity of Chicago, June 15, 1911 (G). MISSOURI: *Standley 9802*, Webster Co., vicinity of Rogersville, thin woods, Sept. 3, 1912 (US); *Letterman*, near Allenton, 1893 (ANS, M, US); *Emig 268*, Elmont, May 23, 1914 (M). FIG. 107, a–f.

The specimen from Percé is only tentatively identified as *T. revolutum*. It is from far out of range and in a very different floristic area.

The correct name for this species is still unsettled. Two nomina dubia antedate *T. revolutum* and when better understood might replace it: *T. purpurascens* L. and *T. pubescens* Pursh.

108. T. MACROSTYLUM Small & Heller, Mem. Torr. Bot. Club, **3:** 8, 1892. *T. Cornuti* L., var. *brevifolium* Shuttleworth in Gray, Syn. Fl. North Am. **1,** part 1: 17, 1895, nomen nudum, nec *T. Cornuti* L., var. *brevifolium* Rugel in Small & Heller, Mem. Torr. Bot. Club, **3:** 8, 1892. *T. polygamum* Muhl., var. *macrostylum* (Small & Heller) Robinson in Gray, Syn. Fl. North Am. **1,** part 1: 17, 1895. *Planta* omnino glabra circa metralis. *Foliolae* saepius coriaceae, obovatae vel oblongae, interdum integrae, saepius apice trilobatae, infernae nonnunquam fere albae, 0.7–1.5 cm. longae. *Inflorescentia* maris conferta et subcorymbosa. Inflorescentia foeminea variabilis. *Sepala* floris masculi 1.5–2.0 mm., foeminei ca. 1 mm. *Filamenta* 3–4 mm., rigida, paullo clavata et sub antheris constricta. *Antherae* 0.5–1.2 mm., oblongae vel oblongo-lanceolatae, *acumine* brevissimo. *Stigma*

(0.7)–1.0–(1.5) mm., alis obscuris. *Carpella* matura haud compressa, nec costata, abrupte stipitata et apice incurvato, *stipite* ca. 0.5 mm., ventro ca. 3 mm. longo et 1.5 mm. lato, *nervis* rugosissimis et nonnunquam sinuosis. *Receptaculum* ad basem capitis fructuum. Floret Junio, Julio et Augusto.—Virginia: *Fernald & Long 9050*, Henrico Co., west of Elko Station, sphagnous springy swales bordering Whiteoak Swamp, Aug. 17, 1938 (G); idem *8711*, July 23, 1938 (G, M); idem *8710* (G); *Fernald, Long & Smart 5778*, on headwaters of Blackwater River, about 3 miles southeast of Petersburg, swampy woods, June 25, 1936 (G); *L. F. & F. R. Randolph 520*, Princess Anne Co., Pungo, open swampy land along West Neck Creek, June 29, 1922 (G). North Carolina: *Small & Heller*, Catawba Co., n. of Hickory, swamp, June 25–26, 1891 (NY, type and isotypes of *T. macrostylum;* F, isotypes); idem *428* (ANS, NY); *Rugel*, Swanano, in pratis vallis, Aug., 1841 (G, *T. Cornuti* var. *brevifolium*); *Heller 1015*, Catawba Co., near Hickory, June 23, 1893 (ANS, F, G, M, NY, US); *Biltmore Herbarium 11,024*, Flat Rock, low grounds, June 6, 1905 (NY, US); *Wiegand & Manning 1216*, Martin Co., June 21, 1927 (G); *Godfrey 4384*, Beaufort Co., Washington, marsh, June 9, 1938 (G); *Godfrey 4375*, Hyde Co., Swanquarter, June 9, 1938 (G); *Godfrey 4449*, Cartaret Co., Newport, marsh, June 10, 1938 (G); *House 4318*, Pisgah Forest, alt. 2500 ft., June 29, 1909 (US); *Peattie 1317*, Polk Co., The Shoals, low wet woods, Aug. 20, 1921 (F); *Peattie 1313 & 1313A*, Polk Co., east of Columbus, edge of a *Magnolia virginica* swamp, Aug. 20, 1921 (NC).

The two herbarium sheets on which Small and Heller picked up the two synonyms given in the original description belong to *T. revolutum* DC.

109. T. **subrotundum,** sp. nov. *Planta* omnino glabra, 1–2 m. alta, nonnunquam debilis ut in proximis innixa est. *Foliolae* integrae membranaceae, interdum coriaceae, orbiculares vel ovatae vel obovatae vel ellipticae interdum lanceolatae, 0.5–1.5 cm. longae. *Inflorescentia* paniculata et plus minusve foliosa. *Filamenta* debilia 3.5–5.0 mm., paullulum apice clavata et sub antheris constricta. *Antherae* ca. 0.75 mm. *Stigma* 1–2 mm., in fructu inflexum. *Carpella* matura conspicue reflexa, *stipite* ca. 1 mm., ventre obovato, *nervis* sinuosissimis et gibbosis. Floret Junio.—South Carolina: *Gibbes*, Georgetown, Apr., 1857 (NY); *Gibbes*, Summerville, May 25, 1855 (NY); *Godfrey & Tryon 1401*, Berkeley Co., 8 miles southwest of Moncks Corners, swampy shrubby peaty woods, Aug. 11, 1939 (G, M, NY); *Godfrey & Tryon 121*, Georgetown Co., 4 miles west of Georgetown, creek-bottom through rich lowland woods, June 27, 1939 (G, NY); *Eggert*, Aiken Co., sandy swamps, Aug. 8, 1898 (M); *Godfrey & Tryon 584*, Berkeley Co., 3 miles southeast of Pine-

ville, rich wooded slope, July 14, 1939 (G, NY). GEORGIA: *J. Davis 1860*, Winnette Co., Stone Mountain, June 18, 1921 (M); *Harper 1380*, Pulaski Co., se. of Hawkinsville, wet shady woods at base of sand-hills of Ocmulgee River, June 27, 1902 (NY, TYPE; G, M, US, ISOTYPES); *P. M. Way 9*, near Tallapoosa, July, 1900 (US); *Harper 1867*, Montgomery Co., near Ochwalkee, dry woods along Oconee River, July 1, 1903 (F, G, M, NY, US); *Harper 1063*, Dooly Co., in shaded limesink near Flint River, July 11, 1903 (M); *Eggert*, De Kalb Co., hill north of Stone Mountain, July 24, 1897 (M); *Harper 1160*, Lee Co., in shaded limesink east of Muckalee Creek, Aug. 2, 1902 (NY, US). FLORIDA: *Berg*, near Tallahassee (NY). ALABAMA: *Earle*, Lee Co., Camp Hill, June 23, 1897 (M, NC, NY); *Harper 3525*, Autauga Co., about 2 miles southeast of Booth, swamp of Bridge Creek, June 15, 1936 (ANS, BG, F, G, M, N-ND, NY, US). FIG. 108, a–d.

110. T. POLYGAMUM Muhl. ex Sprengel, Syst. Veg. **2:** 671, 1825. *T. polygamum* Muhl. Trans. Amer. Phil. Soc. **3:** 172, 1793, ut nomen nudum. *T. corynellum* DC. Syst. **1:** 172, 1817. *T. divergens* Link, Enum. Hort. Berol. **2:** 92, 1822. *T. hirsutum* Mertens ex Lec. Bull. Soc. Bot. Belg. **24:** 264, 1885, nomen nudum, nec *T. hirsutum* Willd. ex Lec. l. c. 280, 1885, pariter nudum. *T. leucostylum* Link ex Lec. l. c. 285, 1885, nomen nudum. *T. pubescens* Nuttall ex Trel. Proc. Bost. Soc. Nat. Hist. **23:** 301, 1886, nomen ex synonymis nec *T. pubescens* Pursh, Fl. Amer. Sept. **2:** 388, 1814, nec *T. pubescens* Schleich. ex DC. Syst. **1:** 174, 1817. *T. altissimum* Greene, Leaflets, **2:** 58, 1910, nec *T. altissimum* Wender, Flora, **9:** 358, 1826, nec *T. altissimum* Thomas ex De Massas, Ann. Sc. Nat. ser. 2, **9:** 369, 1838. *T. Bissellii* Greene, l. c. 55, 1910. *T. hepaticum* Greene, l. c. 59, 1910. *T. Mortoni* Greene, l. c. 57, 1910. *T. perelegans* Greene, l. c. 59, 1910. *T. setulosum* Greene, l. c. 56, 1910. *T. glaucodeum* Greene, l. c. 54, 1910. *T. tortuosum* Greene, Ott. Nat. **24:** 54, 1910, nec *T. tortuosum* Jord., Diagn. **1:** 38, 1864. *T. praealtum* Greene, Leaflets, **2:** 89, 1910. *T. perpensum* Greene, Amer. Midl. Nat., **2:** 295, 1912. *Thalictrum Cornuti* L., var. *stipitum* Farwell, Pap. Mich. Acad. Sci. Arts & Lett. **26** (1940)**:** 11, 1941. *Planta* statura variabili, saepius pubescens. *Pubescentia* pilorum uniseriatorum flexuosorum. *Foliolae* membranaceae variabiles (1.0)–2.5–(7.5) cm. longae, obovatae vel oblongae, apice trilobatae lobis integris. *Inflorescentia* paniculata, apice rotunda, *pedunculis* tenuibus. *Filamenta* rigida 3.5–5.0 mm., *apice* clavata et sub antheris constricta. *Antherae* saepius oblongae ca. 1.0 mm. long. *Stigma* 0.5–2.0 mm., alis obscuris et pilis crassiusculis. *Carpella stipite* 0.2–1.0 mm., ventre saepius ovato vel obovato vel ellipsoideo, *nervis* raro parum sinuosis. Floret Junio, Julio et Augusto.—NEWFOUNDLAND: *Fernald, Long & Fogg 269*, Bay of Islands, southern slope of Lark Mountain,

peaty and turfy subalpine meadows, Sept. 1, 1926 (G); *Howe & Lang 1006*, Bay St. George, Aug. 5–7, 1901 (G); *H. Bishop 319*, near Bonne Bay, Neddy Harbor, wooded banks of stream, Aug. 28–30, 1928 (G). "CANADA": *Kalm* [?] (Linnaean Society Lond., paratype of *T. dioicum;* G, photograph). SAINT-PIERRE et MIQUELON: *L.-Arsène 264*, Chapeau de Miquelon, 31 juil., 1901 (G); *L.-Arsène 239*, Langlade, vallée de la Belle-Rivière, août, 1901 (G). QUEBEC: *Victorin, Rolland, Brunel & Rousseau 17,347*, Percé, sur les corniches de conglomérat, 24 juil., 1923 (G); *J. Macoun 66,630, 66,631 & 66,632*, Cap à l'Aigle, Aug., 1905 (G); *Senn 396*, near Wakefield Lake, streamside, July 24, 1938 (G). PRINCE EDWARD ISLAND: *J. Macoun 869*, Tignish, July 25, 1888 (G-ND, type of *T. glaucodeum;* G, photographs of same); *J. Macoun*, Mt. Stewart, July, 1888 (US); *Fernald, Bartram, Long & St. John 7493*, Mt. Stewart, springy ditch by railroad, July 30, 1912 (G). NEW BRUNSWICK: *Rousseau & Bonin 32,047*, junction of Restigouche and Matapedia Rivers, gravelly banks, July 16, 1929 (G); *Chadbourne*, King's Co., Rothesay, July–Aug., 1883 (G); *Fowler*, Kent Co., Bass River (F). NOVA SCOTIA: *J. Macoun 19,006*, Cape Breton Island, Baddeck, thickets, July 28, 1898 (G-ND, type of *T. tortuosum;* G, photographs of the same); *Fernald & Long 23,853*, Yarmouth Co., Parr Lake, thicket at upper border of cobbly beach, Aug. 12, 1921 (G); *Fernald & Long 23,852*, Digby Co., Little Meteghan Lake, thicket, Aug. 9, 1921 (G); *Perry, Wetmore, Hicks & Prince 10,140*, Antigonish Co., Salt Springs, along brook, Sept. 11, 1925 (G). MAINE: *B. L. Robinson*, Rangeley Lakes, Middle Dam, Aug. 2, 1903 (G); *Fernald*, Penobscot Co., Orono, rocky bank, July 12, 1892 (G, NE); *Fernald 3*, Aroostook Co., St. Francis, low thickets, Aug. 15, 1893 (G). NEW HAMPSHIRE: *A. H. Moore 4032*, Coos Co., Colebrook, foot of Lombard Hill, east of Monadnock House, shaded roadside, July 20, 1907 (G); *Batchelder*, Cheshire Co., Richmond, shore of Sandy Pond, Sept. 3, 1916 (NE). VERMONT: *Day 11*, Bennington Co., Manchester, June 25, July 22, 1898 (G, NE); *Williams*, Ripton, Bread Loaf Inn, July 7, 1908 (G). MASSACHUSETTS: *Churchill*, Berkshire Co., Sheffield, low ground, July 19, 1920 (NE); *Fernald & Long 18,470*, Barnstable Co., Sandwich, Spring Hill, low thicket bordering maple and *Chamaecyparis* swamp, Aug. 9, 1919 (NE); *Bicknell 4329*, Martha's Vineyard, Chilmark, July 3, 1913 (NE, NY). RHODE ISLAND: *Fernald*, Kent Co., Warwick, sandy meadow, June 25, 1910 (G, NE); *Ware & Fernald*, Washington Co., Westerly, boggy swale north of Babcock Pond, Aug. 31, 1919 (NE); *Leland*, East Providence, July 4, 1929 (NE). CONNECTICUT: *Bissell*, Southington, July, 1897 (G-ND, fragment from type of *T. Bissellii;* G, photograph of this fragment); *Meredith*, Litchfield Co., Kent Falls, brookside, Aug. 2, 1927

(ANS); *Wright*, Meriden, July 21, 1879 (NE). NEW YORK: *Lucy 227*, Chemung Co., Elmira, July 2, 1896 (G-ND, fragments of the type of *T. Cornuti*, var. *stipitum;* G, photographs of these fragments); *Muhlenberg 794*, western New York (ANS, *T. polygamum* !); *Fernald, Wiegand & Eames 14,291*, Oswego Co., Oswego, Mud Pond, swampy woods and thickets overlying Silurian sandstones, Aug. 23, 1922 (G). NEW JERSEY: *E. B. Bartram*, Sussex Co., Rosenkraus Run, July 16, 1917 (G); *Long 46,326*, Hunterdon Co., s. of Van Syckles, along Mulhockaway Creek, open alluvial thicket, June 28, 1935 (ANS); *Long 54,624*, Salem Co., ca. 1 mi. s. s. w. of Friendship, along branch of Muddy Creek, low woods, June 30, 1940 (ANS). PENNSYLVANIA: *Muhlenberg 597* (Willdenow Herb., TYPE of *T. polygamum*); *Nuttall*, Philadelphia (ANS, G, *T. pubescens* Nuttall); *Pierron*, Westmorland Co., Aug. 5, 1877 (F); *Harshberger*, head of Naomi Pines Lake, wet places in woods, July 29, 1904 (G); *Schweinitz*, Bethlehem (ANS). DELAWARE: *Canby*, Wilmington, 1866 (G). MARYLAND: *J. D. Smith*, Garrett Co., July 30, 1879 (US). WEST VIRGINIA: *MacElwee*, Marion Co., west of New England, along stream in ravine, July 28, 1907 (ANS); *E. E. Berkeley*, Summer Co., near mouth of Blue Stone River, July 16, 1930 (G); *Greenman 368*, Randolph Co., Big Run, Sept. 14, 1904 (F, G). VIRGINIA: *Fernald & Long 8267*, Surry Co., James River, rich alluvial woods and thickets back of sand-beach below Sunken Meadow Beach, June 14, 1938 (G); *Fogg 14,744*, Giles Co., 0.5 mi. e. of Bane, wooded slope along Walkers Creek, June 29, 1938 (G); *Allard 732*, Fauquier Co., western slopes of Bull Run Mountains, brook-bank near Hopewell Gap, June 30, 1935; *W. Palmer 22*, Bedford Co., Peaks of Otter, alt. 2500 ft., July 28, 1906 (BG, US); *Small*, Smyth Co., at falls of Holston, alt. 2050 ft., July 9, 1892 (F, G, M, US). NORTH CAROLINA: *Ashe*, Grandfather Mt., July 9, 1893 (NC); *Blomquist 237*, Durham Co., river banks, May 3, 1932 (G); *Biltmore Herbarium*, Madison Co., near Marshall, banks of Big Ivy Creek, Aug. 8, 1898 (G, M, NY, US). GEORGIA: *Ruth 10*, Blue Ridge, swamps, July 10, 1900 (US). ONTARIO: *J. A. Morton 10,607*, Wingham, July 13, 1890 (G-ND, type of *T. Mortoni;* G, photographs of type); idem *865* (G-ND, isotype of *T. Mortoni;* G, photographs of same); *Umbach*, Elmira, swamps, July 13, 1899 (F); *E. L. Greene*, Strathroy, June 16, 1909 (G-ND, type and isotypes of *T. perpensum;* G, photographs of the type and of one isotype); idem, June 12, 1909 (G-ND, paratype of *T. perpensum*). OHIO: *F. E. Leonard 87–112½*, Elynia, July 14, 1887 (US). INDIANA: *Friesner*, Floyd Co., New Albany, Aug. 23, 1923 (N-ND). KENTUCKY: *Smith & Hodgdon 3929*, Wayne Co., southwest of Monticello, Beaver Creek, shady ledge, July 12–14, 1937 (G); *Smith & Hodgdon 3695*, Rockcastle Co., between Berea and Mt.

Vernon, slough, July 8, 1937 (G, NY); *Short 2*, alluvium of the Kentucky River (ANS); *Lea 3*, Kenton Co., Banklick Creek, 1834–44 (ANS). TENNESSEE: *Kearney 602*, Cocke Co., near Lemon's Gap, Sept. 3, 1897 (G-ND, type of *T. perelegans;* M, NY, US, isotypes); idem *602½* & *603*, Sept. 8 (M, NC, NY, US); *Svenson 4050*, Morgan Co., Rugby, mossy banks of stream, Aug. 19, 1930 (BG). FIG. 110, a–c.

Thalictrum polygamum Muhl. is antedated by two other validly published names and perhaps by four. Although we know that this name is not the right one for the species, it seems preferable to keep it until we make sure of the right name to take.

Gray gives 1813 (Cat. Plant. Amer. Sept., p. 54) in his Synoptical Flora as the right date for the valid publication of *T. polygamum* Muhl. He considered the two words "smooth, polygamous" as a valid description. Actually these were not intended to be a description, but common names, that is "smooth meadow-rue, polygamous meadow-rue", as stated at the beginning of the Muhlenberg's Catalogue. The first valid publication is, then, Sprengel's in 1825, later than *T. corynellum* DC. 1817, *T. divergens* Link 1822, *T. pubescens* Pursh 1814, and *T. purpurascens* L. 1753.

111. T. POLYGAMUM Muhl., var. HEBECARPUM Fern., RHODORA, **10:** 49, 1908. *T. leucocrinum* Greene, Ott. Nat., **24:** 29, 1910. *T. zibellinum* Greene, l. c. 30, 1910. *T. labradoricum* Greene, l. c. 53, 1910. *T. terrae-novae* Greene, l. c. 52, 1910. *T. canadense* Miller, var. *hebecarpum* (Fern.) House, Bull. N. Y. State Mus. **254:** 346, 1924. *Planta* robustior saepius pubescens et sesquimetralis. *Inflorescentia* ampla subcorymbosa, *pedunculis* crassiusculis et nonnunquam incurvatis. *Filamenta* saepius 5.0–6.5 mm. conspicue clavata. *Antherae* ca. 1.2 mm. *Stigma* 1.5–3.5 mm. *Carpella* matura saepius oblanceolata. Floret Julio et Augusto.—LABRADOR: *H. Bishop 318*, Petty Harbor, 52° 25′ N., 55° 40′ W., sphagnous spruce woods, July 12, 1928 (G); *Fernald & Wiegand 3438*, Blanc Sablon, by brooks, Aug. 6, 1910 (G). NEWFOUNDLAND: *Robinson & Schrenk 187*, St. John's, Rennie's River, rocky banks, Aug. 4, 1894 (US, type of *T. terrae-novae;* ANS, F, G, NY, isotypes); *Fernald & Wiegand 3437*, Port Saunders, gravelly shore, Aug. 6, 1910 (G); *Fernald & Long 28,274*, Bard Harbor Hill, meadow below limestone escarpment, Aug. 21, 1925 (G). QUEBEC: *Williams & Fernald*, Témiscouata Co., Rivière du Loup, gravelly thicket by the Saint Lawrence, Aug. 2, 1902 (G, TYPE of *T. polygamum* var. *hebecarpum*); *Fernald, Bartram, Long & St. John 7492*, Magdalen Islands, Grindstone Island, Grindstone, wet clearing, July 22, 1912 (G);

Richardson 867, Lake Mistassini, wet meadows around springs and along rivulets, July 15, 1870 (C); *Churchill*, Terrebonne Co., Lac Tremblant, July 18, 1922 (G). PRINCE EDWARD ISLAND: *J. Macoun*, Mt. Stewart, Aug. 17, 1888 (G). NEW BRUNSWICK: *J. D. Smith*, Campobello Island, July 17–Aug. 20, 1888 (US, type and isotype of *T. leucocrinum*); *F. T. Hubbard*, Shediac Cape, rich meadow, with alder, July 21, 1914 (G); *Fowler 2*, St. Andrew's, July 3, 1900 (G); *Fernald & Long 13,641*, Carleton Co., Woodstock, gravelly river-thickets and bushy terraces, July 14, 1916 (G). NOVA SCOTIA: *J. Macoun 21,134*, Sable Island, not uncommon on the old land, July 24 & Aug. 2, 1899 (G, isotype of *T. zibellinum*); *Perry & Roscoe 217*, St. Paul Island, between Petries Pond and White Spring, Aug. 3, 1929 (G); *Long & Linder 21,255*, Yarmouth Co., Tusket, peaty spruce and alder thickets bordering swales, July 15, 1920 (G). MAINE: *C. A. E. Long*, Knox Co., Matinicus, swamp, July 6, 1919 (NE); *E. F. Williams*, Mt. Katahdin, Depot Pond, July 16, 1900 (G); *Williams, Collins & Fernald*, Aroostook Co., Presque Isle, July 12, 1902 (G, NE); *A. F. Hill 1481*, Hancock Co., Swans Island, July 8, 1914 (NE). NEW HAMPSHIRE: *Bullard*, Merrimac Co., Hill, roadside, July 12, 1933 (NE); *Pease 16,721*, Coos Co., Randolph, meadow, July 31, 1917 (NE); *C. F. Batchelder*, Rockingham Co., Fremont, edge of swampy woods, July 20, 1927 (NE). VERMONT: *E. F. Williams*, Addison Co., Ripton, Bread Loaf Inn, July 7, 1908 (NE); *Leland*, Windsor, meadows, June 27, 1880 (NE); *Kennedy*, Mount Holly, roadside, June 26, 1908 (G). MASSACHUSETTS: *F. T. Hubbard*, Essex Co., Manchester, wet rich loam by brook, July 15, 1913 (NE); *Sanford 750*, Bristol Co., Fall River, low ground, thicket, July 6, 1914 (NE); *Churchill*, Norfolk Co., Milton, July 2, 1899 (NE). NEW YORK: *Svenson 4578*, Greene Co., N. slope of Hunter Mt., margin of a cold brook, alt. 3500 ft., Aug. 24, 1931 (G); *Muenscher & Maguire 1179*, Franklin Co., hillside of Titus Mountain, roadside, July 13, 1930 (G); *Burnham*, Washington Co., southern W. Fort Ann, east of Tripoli, along Halfway Brook, July 2, 1897 (G). FIG. 111, a and b.

This variety is not a well cut unit but a rather well marked extreme commoner than the typical in northern parts of the range of the species. The following variety exhibits a similar behavior but the relation between the staminate and the pistillate plants has not been made yet. A third variety is perhaps worth recognition in the southern Appalachian upland (*T. altissimum* Greene and *T. perelegans* Greene).

112. T. POLYGAMUM Muhl., var. **intermedium,** var. nov. ? *T. viride* Greene, Leaflets, **2:** 56, 1910. *Planta* metralis pu-

bescens. *Foliolae* subcoriaceae et revolutae. *Inflorescentia* paniculata. *Antherae* 1.5–2.0 mm. RHODE ISLAND: *F. S. Collins 2354*, Bristol, July 12, 1918 (NE). CONNECTICUT: *Woodward*, Franklin, roadside, in rich moist soil, June 24, 1914 (G, TYPE and ISOTYPE of *T. polygamum* var. *intermedium;* NE, ISOTYPE); idem, June 26 (G); idem, July 1, 1915 (NE). MINNESOTA: *Coues*, 1873, Pembina (G). FIG. 112, a and b.

The type of *T. viride* Greene has not been seen by me.

113. T. DASYCARPUM Fischer & Lall. ex Fisch., Mey. & Lall. Ind. Sem. Hort. Petrop. **8:** 72, 1842. *T. Cornuti* L., var. β Fisch. Mey. & Lall. l. c. 72, 1842. *T. virginicum* Drege ex Lec., Bull. Soc. Bot. Belg. **24:** 323, 1885, nomen ex synonymis. *T. purpurascens* L., var. *dasycarpum* (Fisch. & Lall.) Trel., Proc. Bost. Soc. Nat. Hist. **23:** 301, 1886. *T. vegetum* Greene, Midl. Nat. **1:** 103, 1909. *T. albens* Greene, Amer. Midl. Nat. **2:** 292, 1912. *T. Moseleyi* Greene, l. c. 294, 1912. *T. Nortoni* Greene, l. c. 292, 1912. *T. Sandbergii* Greene, l. c. 293, 1912. *T. Wightianum* Greene, l. c. 293, 1912. *Leucocoma dasycarpa* (Fisch. & Lall.) Nieuwland, Amer. Midl. Nat. **3:** 324. 1914. *L. albens* (Greene) Lunell, Amer. Midl. Nat. **4:** 361, 1916. *L. vegeta* (Greene) Lunell, l. c. 1916. *Planta* metralis et pubescens. *Pubescentia* saepius densa pilorum uniseriatorum et flexuosorum. *Rami* et *folia* plus minusve conferta. *Foliolae* coriaceae, margine revoluto, oblongae, apice trilobatae, lobis acutis. *Inflorescentia* paniculata apice acuta. *Filamenta* capillaria et sub antheris paululum dilatata nec constricta, ca. 4 mm. *Antherae* 1.5–2.5 mm., oblongo-linearia, *acumine* 0.1–0.4 mm. *Stigma* 2–3 mm. *Receptaculum* ad basem capitis fructuum. *Carpella* matura *stipite* 0.1–0.3 mm., ventre saepius ovato, apice nonnunquam incurvato, *nervis* haud sinuosis. Floret Junio Julioque.—RUSSIA (cultivated): ex horto botanico petropolitensi (US, presumably from type colony in the garden). NORTH AMERICA: *Franklin Expedition* (G). ONTARIO: *C. F. Williamson 1949*, Fort William, river-banks, July 31, 1912 (ANS); *E. & D. M. Anderson 26,018B*, Timagami Region, Sandy Inlet, July 21, 1926 (G); *Pease & Ogden 25,038*, Manitoulin Island, Providence Bay, beach, July 5, 1935 (G); *Taylor, Hosie, Fitzpatrick, Losee & Leslie 2280*, Algoma District, Carp Lake, cedar-yellow birch association, July 25, 1935 (C); *Taylor, Losee & Bannan 904*, Thunder Bay District, Marie Louise Creek, along stream, Aug. 13, 1936 (C); *W. S. 62,298*, Moose Factory, July 15, 1904 (C). MICHIGAN: *W. F. Wight 118b*, Allegan Co., along Kalamazoo R. at Allegan, Sept. 11, 1902 (US, type, on two sheets, of *T. Wightianum*); *Barlow*, Marquette Co., Turin, by flowing water, July 8, 1901 (G); *Fernald & Pease 3307*, Houghton Co., southwest of Houghton, border of swamp, July 3, 1934 (G); *L. H. Bailey*,

near Lansing, June 13, 1886 (G). OHIO: *Webb 491*, Portage Co., Garrettsville, June 24, 1901 (G); *Moseley*, Erie Co., Oxford Tp., June 8, 1895 (US, type of *T. Moseleyi*). INDIANA: *Deam 57,871*, Wells Co., Bluffton, June 21, 1937 (G); *Deam 57,873*, Noble Co., Wolcottville, in a marsh, June 22, 1937 (G); *H. W. Clark 1870*, near Lake Maxinkuckee, June 26, 1901 (US). WISCONSIN: *H. W. Edmonds*, Vilas Co., Eagle River, 1926 (NY); *Fassett & Wilson 4301*, Buffalo Co., Fountain City, sandy R. R. embankment, Aug. 25, 1927 (G); *Schuette*, Brown Co., Dach's Creek, July 11, 1895 (G, NC). ILLINOIS: *Bebb*, Fountaindale, 1867 (G); *Vasey*, N. Ill. (G). MANITOBA: *Herriot 69,801*, Hamiota, June 22, 1906 (G). MINNESOTA: *Sandberg 1193*, Itaska Lake, wet places, July, 1891 (US, type and isotype of *T. Sandbergii*); *Ballard*, Nicolet Co., Swan Lake, June, 1892 (G); *Rosendahl 666*, Spring Grove, June 30, 1902 (G); *Arthur & Bailey B460*, Agate Bay, July 29, 1886 (G); *Stevens 186*, Muskoda, July 19, 1936 (G, UC). IOWA: *Pammel 596*, McGregor, Aug. 15, 1925 (G); *Pammel & Zimmerman 275*, Feinback, June 23, 1925 (G); *Ball 2*, Ames, July 18, 1896 (G). MISSOURI: *E. J. Palmer 18,991*, Atchison Co., near Watson, wooded slopes of loess hills, Sept. 4, 1920 (M); *Palmer & Steyermark 41,055*, Schuyler Co., Chariton River, low open woods, July 1, 1933 (M); *Palmer & Steyermark 41,242a*, Grundy Co., Trenton, woods along creek, July 4, 1933 (M); *Palmer & Steyermark 41,327*, Mercer Co., Saline, along north-facing wooded bluff of Little River, July 5, 1933 (M). NORTH DAKOTA: *Lunell*, Ramsay Co., Devil's Lake, in woods, July 16, 1902 (G-ND, type of *T. vegetum;* G, photographs); *Lunell*, Devil's Lake, July 1, 1905 (G-ND, paratype of *T. vegetum;* G, photographs); *Lunell*, Pierce Co., Pleasant Lake, thickets, June 19, 1901 (F, G); *Lunell*, McHenry Co., Towner, July 27, 1913 (F, US). SOUTH DAKOTA: *E. J. Palmer 37,636*, Washabaugh Co., Interior, in deep ravines, June 29, 1929 (G); *T. A. Williams*, vicinity of Brookings, June 17, 1896 (US); *Hayward 1594*, Black Hills, Hot Springs, mixed prairie, 1927 (F). NEBRASKA: *Tolstead 513a*, Valentine, along the banks of the Niobrara river, July 27, 1936 (G); *F. Clements*, St. James, June 24, 1893 (G, US); *Rydberg 1413*, on South Fork of Dismal River, in meadow, Aug. 14, 1893 (G). KANSAS: *J. B. Norton 5a*, Riley Co., 1896 (US, type of *T. Nortoni;* G, M, NY, US, isotypes); *M. White*, Cowley Co., June, 1898 (M); *Rydberg & Imler 44*, Miami Co., between Olathe and Pleasanton, June 18, 1929 (NY). SASKATCHEWAN: *Bourgeau*, 1857–1858 (G); *Herriot 69,801a*, Yorkton, damp thickets, July 6, 1906 (G). ALBERTA: *Herriot 69,800*, 6 miles e. of Edmonton, Aug. 24, 1906 (F, G); *E. H. Moss 2209*, Edmonton, amongst shrubs, July 6, 1931 (G). MONTANA: *R. S. Williams 418*, Great Falls, July 4 & July 20, 1886 (US). IDAHO: *Leiberg 1576*, Clarks Fork Valley, below Weeksville, alt.

650 m., Aug. 23, 1895 (G). WYOMING: *F. L. Bennett 827*, Black Hills, Sand Creek Canyon, shady flood-plain, alt. 3800 ft., June 24, 1938 (CA); *A. Nelson 8338*, Laramie Co., Badger, thickets on river-banks, July 1, 1901 (US). COLORADO: *Cowen 27 & 32*, Fort Collins, river-bank, alt. 5000 ft., July 1, 1895 (G, US). NEW MEXICO: *Standley 13,541*, Colfax Co., vicinity of Ute Park, meadow along creek, alt. 2200 to 2900 m., Aug. 22, 1916 (US); *Arsène & Benedict 17,431*, vicinity of Watrous, alt. 1950 m., Aug. 27, 1926 (CA, US); *Vasey*, Las Vegas, 1881 (US). ARIZONA: *Haugh*, Showlow, July 14 (US). FIG. 113, a and b.

A study of the polygamo-dioeciousness of this species was published by J. H. Schaffner in the Ohio Journ. Sci. **20:** 25, 1919.

114. T. DASYCARPUM Fisch. & Lall., var. **hypoglaucum** (Rydberg), stat. nov. *T. hypoglaucum* Rydb. Brittonia, **1:** 88, 1931. *T. macrostigma* Torr. ex Trel., Proc. Bost. Soc. Nat. Hist. **23:** 301, 1886, ut synonymon. *T. amphibolum* Greene, Fedde, Rep. Nov. Spec. **7:** 255, 1909. *T. dasycarpum* Fisch. & Lall., f. *hypoglaucum* Steyermark, RHODORA, **40:** 178, 1938. *Planta* saepius glabra. *Foliolae* saepius membranaceae. *Filamenta* 4–7 mm. *Antherae* 2.2–3.2 mm. *Stigma* 2.5–5.0 mm. *Receptaculum* ad centrum capitis fructuum. *Carpella* matura recta ventre lanceolato et *nervo* ventrali paullulum convexiore quam dorsali. Floret Majo et Junio. MISSOURI: *Standley 9298*, Greene Co., creek-bottom, vicinity of Ash Grove, Aug. 24, 1912 (US); *E. J. Palmer 36,684*, Johnson Co., Columbus, thickets, limestone hills and low woods, June 21, 1930 (G); *Bush 4*, Independence, June 26, 1895 (NY); *Steyermark 5938*, Nodaway Co., Parnell, dry open woods of Bunker Hill, June 20, 1938 (F). ARKANSAS: *E. Palmer 4*, between Fort Cobb and Fort Arbuckle, 1868 (NY, US, *T. macrostigma*); *Bush 2479*, Miller Co., woods, April 27, 1905 (M); *Fassett 19,760*, Hempstead Co., Hope, April 20, 1938 (G). LOUISIANA: *Hale*, Alexandria, 1840 (NY, US, *T. macrostigma*). SOUTH DAKOTA: *T. A. Williams*, Big Stone, Aug. 7, 1895 (US); *Hayward 135*, Spearfish Canyon, streamside, Aug. 1, 1926 (NY); *Brenckle 41–27*, east of Malette, river-bottom, in woods, June 16, 1941 (G). NEBRASKA: *Bates*, Red Cloud, June 11, 1906 (G); *E. S. Bacon*, Neligh, June 15, 1896 (G). KANSAS: *Hall*, Aug., 1870 (F); *Kellerman*, Manhattan, 1887 (M). OKLAHOMA: *G. W. Stevens 2086*, Washington Co., Copan, in moist shady woods, Aug. 15, 1913 (G); *Merrill & Hagan 546*, Platt National Park, June 3, 1935 (F, US); *G. W. Stevens 920*, Caddo Co., Hinton, bottoms of Devil's Canyon, June 15, 1913 (G, US); *J. Clements 11,583*, Comanche Co., Fort Sill, June 2, 1916 (G). TEXAS: *Hall 2*, Dallas, creek-banks, 1872 (NY, TYPE of *T. hypoglaucum;* F, G, M, US, ISOTYPES); *Eggert*, Mowie, woods, June 13, 1898 (M, NY, paratypes of *T. hypoglaucum*); *Lindheimer*,

Houston, April, 1842 (G, US); *Lewton 57*, Victoria Co., Victoria, March 23, 1905 (US). MONTANA: *Spragg 369*, Square Butte, canyons, July 15, 1901 (G); *Watson 7*, near Frenchtown, Aug. 4, 1880 (G, US); *M. E. Jones*, Ravalli, Middle Temperate Life Zone, alt. 3000 ft., July 14, 1909 (CA, UC). COLORADO: *Cowen 32*, Fort Collins, river-bank, alt. 5000 ft., July 1, 1895 (G); *Bethel*, Platte, July 31, 1916 (US). ARIZONA: *J. W. Lead 1511*, White Mountains, meadows, July 30, 1935 (US); *Rusby*, Oak Creek, 1883 (ANS, F, G, NY, US). WASHINGTON: *Kreager 377*, Box Canyon, Aug. 2, 1902 (US). BRITISH COLUMBIA: *J. Macoun 10,059*, Waterton Lake, thickets, July 27, 1895 (C); *J. Macoun 860*, Warm Springs, open places, July 5, 1890 (C). FIG. 114, a and b.

The carpel is not always perfectly closed in the genus *Thalictrum*. Near the base of the style the ventral nerves are free for a short distance and not infrequently there is a transition in the tissue of the carpel between the two ventral nerves. This is more easily seen in nearly mature fruits of *T. dasycarpum* Fisch. & Lall. var. *hypoglaucum*.

SPECIES HAUD SATIS COGNITA

115. T. DOMINGENSE Urban, Symb. Ant. **6:** 10, 1909. *Caulibus* tenuibus debilibus glabris; *foliis* ter usque semel pinnatis, *foliolis* ambitu suborbicularibus, subquadratis v. rhomboideis, raro usque infra medium 3-sectis, plerumque antice trilobis v. tricrenatis, glabris; *inflorescentiis* 1–2-floris; *sepalis* 3.5 mm. longis, albis, subtus violaceo-maculatis; *antheris* ovatis obtusis; *acheniis* sessilibus anguste lanceolatis, longitrorsum striatis, rostro uncato excepto cr. 3 mm. longis, 0.7 mm. latis.

Caules debiles, verisimiliter plantis aliis incumbentes, inferne usque 1.5 mm., medio vix supra 0.5 mm. crassi, teretes v. obtusanguli. *Stipulae* semiovatae, inferae usque 4 mm. longae, superiores sensim decrescentes, margine saepius dentatae, marcescentes. *Folia* inferiora usque 5 cm. longe petiolata; *foliola* 1.3–0.5 cm. diametro, lobis integris v. obsolete crenatis, lateralia 1–4 mm., terminalia usque 7 mm. longe petiolulata, supra obscure, subtus pallide viridia v. glaucescentia, supra obsolete, subtus manifeste nervosa. *Flores* primarii (terminales) 10–12 mm., secundarii (ex axilla folii simplicis v. bracteiformis abeuntes) usque 3.5 cm. longe pedicellati. *Sepala* non unguiculata, ovata v. ovalia, apice obtusa, 2 mm. lata. *Stamina* cr. 10; *filamenta* 2 mm. longa; *antherae* 0.5 mm. longae, muticae. *Carpella* 8–10; *stylus* evolutus; *stigmata* revoluta, stylo fere duplo longiora. *Achenia* stylo et stigmate persistente rostrata, striis circumcirca 7–8 prominentibus notata, tenuioribus hinc illinc interjectis.

Hab. in Haiti in Morne la Selle prope fontem Rivière Blanche de Jacmel 1800–1900 m. alt., m. Aug. flor. et fruct.: Christ n. 1848, 1848b.

Obs. Species hujus generis prima ex Antillis cognita, peculiaris, habitu foliorum *Th. Fendleri* Engelm. et *Th. Wrightii* Gray (ex. America sept.) in memoriam revocans, sed ab iis statura, inflorescentia, antheris, acheniis omnino diversa.

The preceding text is a copy of the original description. I have not seen any material of this species but it seems to differ from the continental species and probably belongs to the *Debilia*.

NOMINA DUBIA

T. PURPURASCENS L., Sp. Pl., **1:** 546, 1753. *T. dioicum* L., var. *α purpurascens* (L.) Provancher, Fl. Can. **1:** 5, 1862.

Of the type of this species in the herbarium of Linnaeus I have seen only the negative of a 35 mm. photograph. It is the upper half of a staminate plant collected in early bloom and looks pretty much like *T. revolutum* DC., but could be just as well *T. polygamum* Muhl.

T. PUBESCENS Pursh, Fl. Amer. Sept. **2:** 388, 1814. *T. polygamum* Muhl., var. *pubescens* (Pursh) K. C. Davis, Minn. Bot. Stud. **2:** 514, 1900.

The descriptions of *Thalictra* given by Pursh in his Flora are all more or less obscure to me and there are a few too many. I have seen five of Pursh's collections from the B. S. Barton herbarium. But that did not elucidate the problem. I suspect the type to be in the Delessert Herbarium and to belong either to *T. polygamum* Muhl. or to *T. revolutum* DC.

T. CAROLINIANUM Bosc and var. SUBPUBESCENS DC. Syst. **1:** 174, 1817, nec *T. carolinianum* Walter, Fl. Car., 157, 1788.

I have not seen any typical material of this species and its variety, and Lecoyer, who has seen the type specimens in the Delessert herbarium, considers them as synonyms of *T. polygamum* and *T. dasycarpum*, but his account is not very satisfactory. De Candolle's description is not very clear, but as the name *T. carolinianum* Bosc is already preoccupied by one of Walter's species, its correct interpretation is of little consequence.

T. MEGACARPUM Torr. Cat. Pl. Fremont Exped. 87, 1845. nomen nudum. *T. megacarpum* Torr. ex Rydberg, Fl. Rocky

Mts. 290, 1918. *T. occidentale*, var. *megacarpum* (Torr.) St. John, Fl. South. Wash. & adj. Idaho, 158, 1937.

The type of this species I have seen, but it greatly puzzles me. The foliage is typical of *T. occidentale* Gray var. *palouense* St. John; its inflorescence is pretty much like that of *T. confine* Fern. var. *columbianum* (Rydb.) nostrum, and the fruit, although closer to certain forms of *T. Fendleri* Engelm., also recalls that of *T. occidentale* Gray var. *typicum*. Such a specimen I consider as being either abnormal or of hybrid origin.

Other names have been discarded for various reason but none of them is likely to be entitled to supersede any of the names adopted in this paper. The list of these names follows:

Sect. CAMPTONOTUM Prantl, Nat. Pflanzenf. 3, **2:** 66, 1888.
Sect. CAMPTONOTUM, c. PETALOIDEA Prantl, l. c.
Sect. CAMPTOGASTRUM, c. PLATYCARPA Prantl, l. c.
T. MEXICANUM DC. Syst. **1:** 187, 1817, nomen provisorium.
T. CORNUTI L., var. MONOSTYLA [author?], Bot. Zeit. **3:** 218–219, 1845, nomen nudum.
T. PURPUREUM K. C. Davis, Minn. Bot. Studies, **2:** 513, 1900, nomen ex synonymis *Thalictri purpurascentis* L., nec. *T. purpureum* Schang ex Pall., N. Nord. Beitr., **6:** 42.

EXPLANATION OF FIGURES

FIGS 2–25 (p. 351), all × 4

FIG. 2. THALICTRUM HULTENII Boivin: stamen, *Everman 120*. 3. T. ALPINUM L., var. TYPICUM: a) sepal, *Blaisdell*, 1800; b) stamen, *Eugenius*, 26 julii, 1935; c) ovary, *Pease & Smith 25,761;* d) bract, peduncle and fruit, *Fidtz*, Aug. 11, 1910. 5. T. ALPINUM L., var. STIPITATUM Yabe: a) ovary, *Rock 17,865;* b) fruit, *Takemoto 591*. 8. T. BAICALENSE Turcz.: fruit, *Hsia 2310*. 9. T. BAICALENSE Turcz., var. MEGALOSTIGMA Boivin: fruit, *Fang 3619*. 10. T. PHILIPPINENSE C. B. Robinson: fruit, *Williams 1137*. 11. T. FILAMENTOSUM Max.: fruit, *Maximovicz*, Amur. 12. T. CLAVATUM DC.: a) peduncle and sepal, *Magee*, Lickstone; b) peduncle and anther, id.; c) seed, *Thaxter*, Cullowhee; d) section of fruit with seed, *Magee*, Lickstone; e) peduncle and fruit, id. 13. T. DECLINATUM Boivin: a) stamen, *Tsiang 5662;* b) fruit, id. 14. T. ACUTIFOLIUM (Hand.-Mazz.) Boivin: a) sepal, *Handel-Mazzetti 11,173;* b) stamen, id.; c) fruit, *Ko 52,821*. (The "c" of "14c" has been omitted by error.) 15. T. MICROGYNUM Lec.: fruit, *Henry 3932*. 16. T. UNGUICULATUM Boivin: a) sepal, *Tsiang 5662;* b) fruit, id. 17. T. GUEGUENII Boivin: a) sepal, *Tsang 23,486;* b) anther, id.; c) fruit, id. 18. T. MIRABILE Small: a) stamen, *Smith & Hodgdon 3928;* b) fruit, id.; c) fruit, *Earle 2212*. Fig. 18c is placed next to fig. 12e. 19. T. TUBERIFERUM Max.: fruit, [*?Watanabe*], Tagakushi-san. 20. T. WATANABEI Yatabe: fruit, [*?Watanabe*], Nanokawa, 1892. 21. T. CHIAONIS Boivin: a) stamen, *Chiao 18,719;* b) fruit, id. 23. T. ICHANGENSE Lec.: fruit, *Wilson 492*. 25. T. SPARSIFLORUM Turcz., var. TYPICUM: a) stamen, *Komarov 724;* b) fruit, id.

FIGS. 26–43 (p. 371), all × 4

FIG. 26. T. SPARSIFLORUM Turcz., var. RICHARDSONII (Gray) Boivin: fruit, *Kellogg 211.* 27. T. SPARSIFLORUM Turcz., var. SAXOMONTANUM Boivin: fruit, *Nelson 6364.* 28. T. SPARSIFLORUM Turcz., var. NEVADENSE Boivin: fruit, *Heller 7056.* 29. T. AQUILEGIFOLIUM L.: a) section of fruit and seed, *Puget,* Chablais; b) peduncle and fruit, id. 30. T. ADUNCUM Boivin: a) sepal, *Humbert 7448;* b) stamen, id.; c) ovary id.; d) peduncle and fruit, id. 31. T. RHYNCHOCARPUM Dill. & Rich.: a) stamen, *Linder 2116;* b) sepal, id.; c) ovary, id.; d) peduncle and fruit, *Schimper 472.* 32. T. INNITENS Boivin: a) sepal, *Swynnerton 352;* b) stamen, id.; c) ovary, id.; d) peduncle and fruit, *Owan 598.* 33. T. CHAPINII Boivin: a) sepal, *Chapin 386;* b) stamen, id.; c) ovary, id.; d) peduncle and fruit, *Mearns 2320.* 34. T. IMPEXUM Boivin: a) sepal, *Curtis 839;* b) stamen, id.; c) ovary, id.; d) fruit, *Mearns 630.* 36. T. STEINBACHII Boivin: a) sepal, *Steinbach 8869;* b) ovary, id.; c) fruit, id. 37. T. STEYERMARKII Standley: a) ovary, *Standley 85,140;* b) fruit, id. 38. T. CINCINNATUM Boivin: a) ovary, *Steinbach 9231;* b) fruit, id. 39. T. MACROCARPUM Gren.: fruit, *Cosson,* Gourzy. 40. T. INUNCANS Boivin: a) sepal, *Fiebrig 2440;* b) ovary, id.; c) stamen, id. 41. T. GALEOTTII Lec.: a) stamen, *Galeotti 4541;* b) ovary, id.; c) fruit, id. Fig. 41a and 41b were drawn from actual specimens; fig. 41c from a photograph of the type. 42. T. HINTONII Boivin: fruit, *Hinton 6743.* 43. T. DECIPIENS Boivin: a) ovary, *Herrera 1047a;* b) fruit, id.

FIGS. 44–69 (p. 409) all × 4, except 51a and 63a, these × 1/5

FIG. 44. T. VIRIDULUM Boivin: fruit, *Seibert 204.* 45. T. PANAMENSE Standley: fruit, *Davidson 791.* 46. T. MACBRIDEANUM Boivin: a) sepal, *Macbride 4466;* b) stamen, id.; c) ovary, id.; d) fruit, id. 47. T. DEAMII Boivin: fruit, *Pringle 5071.* 48. T. GRANDIFOLIUM Wats.: fruit, *Jones,* Soldier Canyon. 49. T. HERNANDEZII Tausch: fruit, *Abbott 238.* 50. T. PACHUENSE Rose: fruit, *Pringle 9678.* 51. T. STANDLEYI Steyermark: a) leaflet, *Steyermark 36,258;* b) fruit, *Standley 84,271.* 52. T. JOHNSTONII Stand. & Steyer.: a) ovary, *Heyde & Lux 2977;* b) stamen, *Johnston 1643;* c) nearly mature fruit, *Heyde & Lux 2977.* 53. T. LANATUM Lec.: fruit, *Purpus 2714.* 54. T. PENNELLII Boivin: fruit, *Pennell 18,505.* 55. T. PARVIFRUCTUM Boivin: fruit, *Pennell 19,555.* 56. T. STRIGILLOSUM Hemsley: fruit, *Rose & Hay 6188.* 57. T. LAETEVIRIDE Boivin: fruit, *Johnston & Muller 463.* 58. T. LASIOSTYLUM Presl: fruit, *Pennell 14,338.* 59. T. SUBPUBESCENS Rose: fruit, *Pringle 11,917.* 60. T. PUBIGERUM Bentham: fruit, *Pringle 4143.* 61. T. CONZATTII Boivin: fruit, *Conzatti & Gonzalez 314.* 62. T. SESSILIFOLIUM Boivin: *Nicolas,* Hacienda Alamos. 63. T. REFRACTUM Boivin: a) ramification of the petiole, *Cuatrecasas 9664;* b) fruit, id. 64. T. PENINSULARE (Brandegee) Rose: a) sepal, *Brandegee,* El Taste; b) stamen, id.; c) ovary, id.; d) peduncle and fruit, id. 65. T. GIBBOSUM Lec.: peduncle and fruit, *Pringle 6511.* 67. T. RUTIDOCARPUM DC.: fruit, *Dombey,* Peru. Drawn from a photograph of the type. 68. T. VESICULOSUM Lec.: fruit, *Penland & Summers 1014.* 69. T. NELSONII Boivin: a) ovary, *Nelson 1788;* b) fruit, id.

FIGS. 70–89 (p. 429), all × 4

FIG. 70. T. PODOCARPUM HBK.: a) ovary, *Killip & Smith 16,017;* b) peduncle and fruit, id. 71. T. VENTURII Boivin: a) peduncle and stamen, *Venturi 10,026;* b) ovary, id.; c) fruit, id. 72. T. LANKESTERI Standley: a) sepal, *Brenes 14,506;* b) stamen, id.; c) ovary, id.; d) fruit, *Lankester 337.* 73. T. TORRESII Standley & Boivin: a) sepal, *Torres 187;* b) stamen, id.; c) ovary, id.; d) fruit, id. 74. T. GUATEMALENSE C. DC. & Rose: a) sepal, *Arsène 2610;* b) stamen, id.; c) ovary, id.; d) fruit, *Hayes,* Las Vacas. 75. T. TRELEASII Boivin: a) sepal, *Langlassé 1061;* b) stamen, id. 76. T. PELTATUM DC.: a) sepal, *Hinton 4547;* b) stamen, *Alaman,* Mexico; c) ovary, *Hinton 4547.* Fig. 76b was drawn from the photograph of the type. 77. T. PRINGLEI Wats.:

a) sepal, *Pringle 2478;* b) stamen, id.; c) ovary, id.; d) fruit, *Leavenworth & Hoogstraal 989.* 79. T. ROSEANUM Boivin: a) sepal, *Pringle 7205;* b) stamen, id.; c) ovary, *Pringle 7448;* d) fruit, *Pringle 8261.* 80. T. ARSENII Boivin: a) sepal, *Arsène*, Jaripeo; b) stamen, *Arsène 5470;* c) fruit, id. 81. T. JALISCANUM Rose: a) sepal, *Hinton 4259;* b) stamen, id.; c) fruit, *Hinton 6557.* 82. T. CUERNAVACANUM Rose: a) sepal, *Pringle 6878;* b) ovary, id.; c) stamen, id.; d) peduncle and fruit, id. 84. T. TEXANUM (Gray) Small: a) sepal of pistillate flower, *Hall 3;* b) ovary, id.; c) sepal of staminate flower, id.; d) peduncle and stamen, id.; e) peduncle and fruit, id.; f) section of fruit and seed, id. 85. T. DEBILE Buck.: fruit, *Buckley*, Alabama. 86. T. ARKANSANUM Boivin: fruit, *Bush 2445.* 87. T. PUDICUM Standley & Boivin: portion of stem with stipule and base of petiole, *Leavenworth & Hoogstraal 1013.* 88. T. MADRENSE Rose: fruit, *Rose 2232.* 89. T. PINNATUM Wats.: a) sepal of staminate flower, *Townsend & Barber 134;* b) sepal of pistillate flower, id.; c) fruit, *Le Sueur 1059.*

FIGS. 92–114 (p. 467), all × 4; except 101e, × 1/5, and 110c and 113a, these × 3

FIG. 92. T. VENULOSUM Trel.: a) sepal of pistillate flower, *Roy*, Bellerive; b) ovary, id.; c) sepal of staminate flower, *Potter 380;* d) stamen, *Herriot 69,803;* e) fruit, *Scamman 2892.* 93. T. CONFINE Fern.: a) sepal of pistillate flower, *Potter 381;* b) sepal of staminate flower, *Victorin & Rolland 18,777;* c) ovary, id.; d) stamen, *Potter 382;* e) fruit, *Knowlton*, Grand Isle; f) section of fruit and seed, *Potter 383.* 96. T. STEELEANUM Boivin: a) sepal of pistillate flower, *Morris 1527;* b) sepal of staminate flower, *Steele*, Feeder Dam Island, July 10; c) stamen, *Steele*, Feeder Dam Island, May 10; d) fruit, *Long & Bartram 1292.* 97. T. CORIACEUM (Britt.) Small: fruit, *Curtiss*, Bedford Co. 99. T. OCCIDENTALE Gray, var. TYPICUM: fruit, *Hall*, 1871. 101. T. OCCIDENTALE Gray, var. PALOUENSE St. John: a) peduncle and fruit, *Raup & Abbe 3867;* b) peduncle and fruit, *Kirkwood 1876;* c) section of fruit and seed, id.; d) stamen, *Cusick 1515;* e) inflorescence, *Kirkwood 1876.* 102. T. FENDLERI Engelm.: a) peduncle and stamen, *Metcalfe 248;* b) section of fruit and seed, *Munz 8696;* c) fruit, id.; d) fruit, *Parish 1483;* e) fruit, *Heller 11,669.* 103. T. FENDLERI Engelm., var. WRIGHTII (Gray) Trel.: fruit, *Wright 834.* 104. T. FENDLERI Engelm., var. SINUOSUM Boivin: fruit, *Nelson 4749.* 105. T. FENDLERI Engelm., var. QUADRINERVATUM Boivin: fruit, *Wiggins & Demaree 4941.* 106. T. POLYCARPUM (Torr.) Wats.: a) sepal of pistillate flower, *Kellogg & Harford 3;* b) stamen, *Hansen 563;* c) fruit, *Smith 306.* 107. T. REVOLUTUM DC.: a) stamen, *Pease 3782;* b) sepal of staminate flower, id.; c) sepal of pistillate flower, *Rich*, Stoneham; d) ovary, id.; e) seed, *Fernald & Weatherby 16,807;* f) fruit, id. 108. T. MACROSTYLUM Small & Heller: a) sepal of pistillate flower, *Small & Heller*, Hickory; b) sepal of staminate flower, *Small & Heller 428;* c) stamen, *Small & Heller*, Hickory; d) fruit, *Small & Heller 1015.* 109. T. SUBROTUNDUM Boivin: a) ovary, *Godfrey & Tryon 121;* b) stamen, id.; c) peduncle and fruit, id. 110. T. POLYGAMUM Muhl.: a) stamen, *Burnham*, Tripoli; b) fruit, *Robinson*, Rangeley Lakes; c) head of mature carpels, *Muenscher & Clausen 4649.* 111. T. POLYGAMUM Muhl., var. HEBECARPUM Fern.: a) stamen, *Fernald & Williams*, Rivière du Loup; b) fruit, *Fernald & Long, 28,274.* 112. T. POLYGAMUM Muhl., var. INTERMEDIUM Boivin: stamen, *Woodward*, Franklin. 113. T. DASYCARPUM Fisch. & Lall.: a) head of mature carpels, *Lunell.* Lake Ibsen; b) stamen, *Moseley*, Oxford. 114. T. DASYCARPUM Fisch. & Lall., var. HYPOGLAUCUM (Rydb.) Boivin: a) ventral side of an immature fruit showing the fully expanded stigma and the small hole in the wall of the ovary near the base of the style, *Stevens 920;* b) stamen, *Palmer 3969.*